FIG. 1

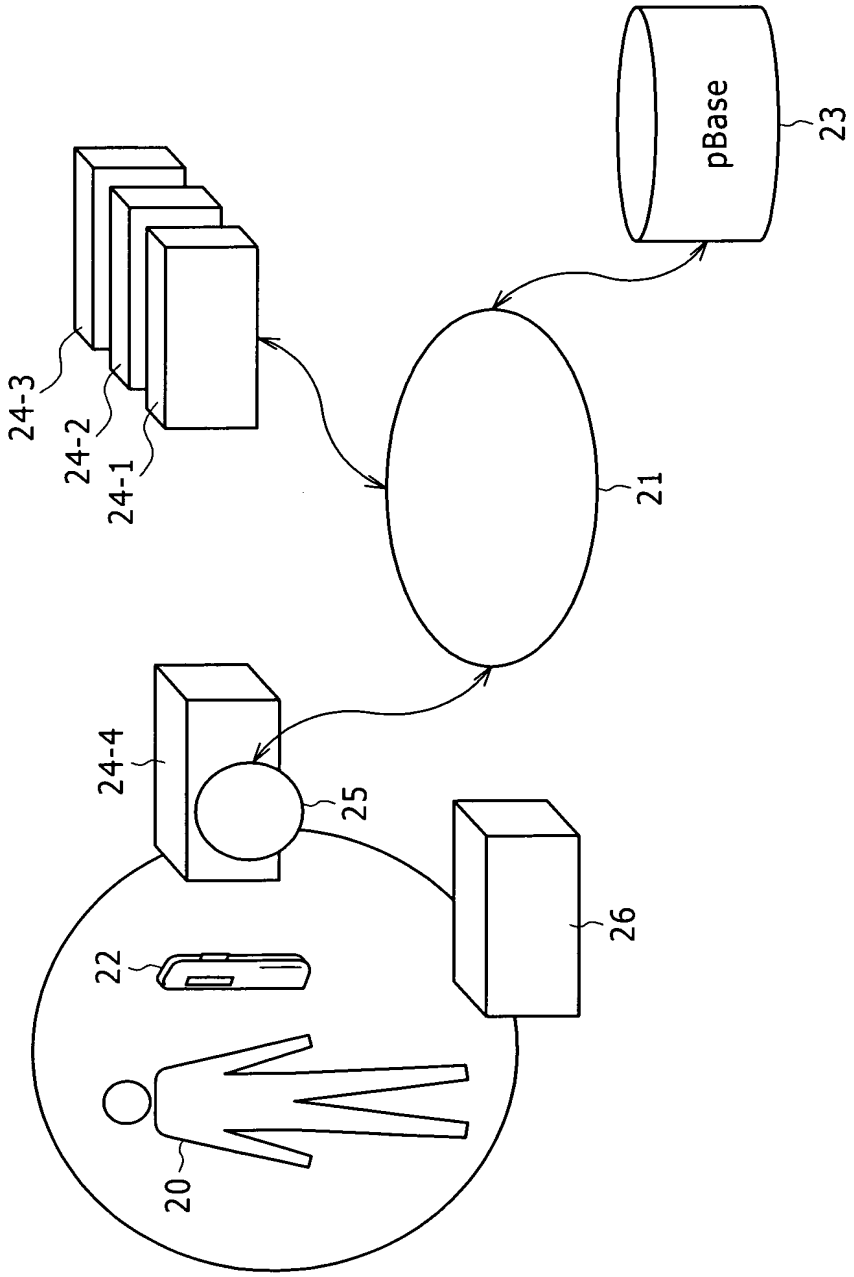


FIG. 2

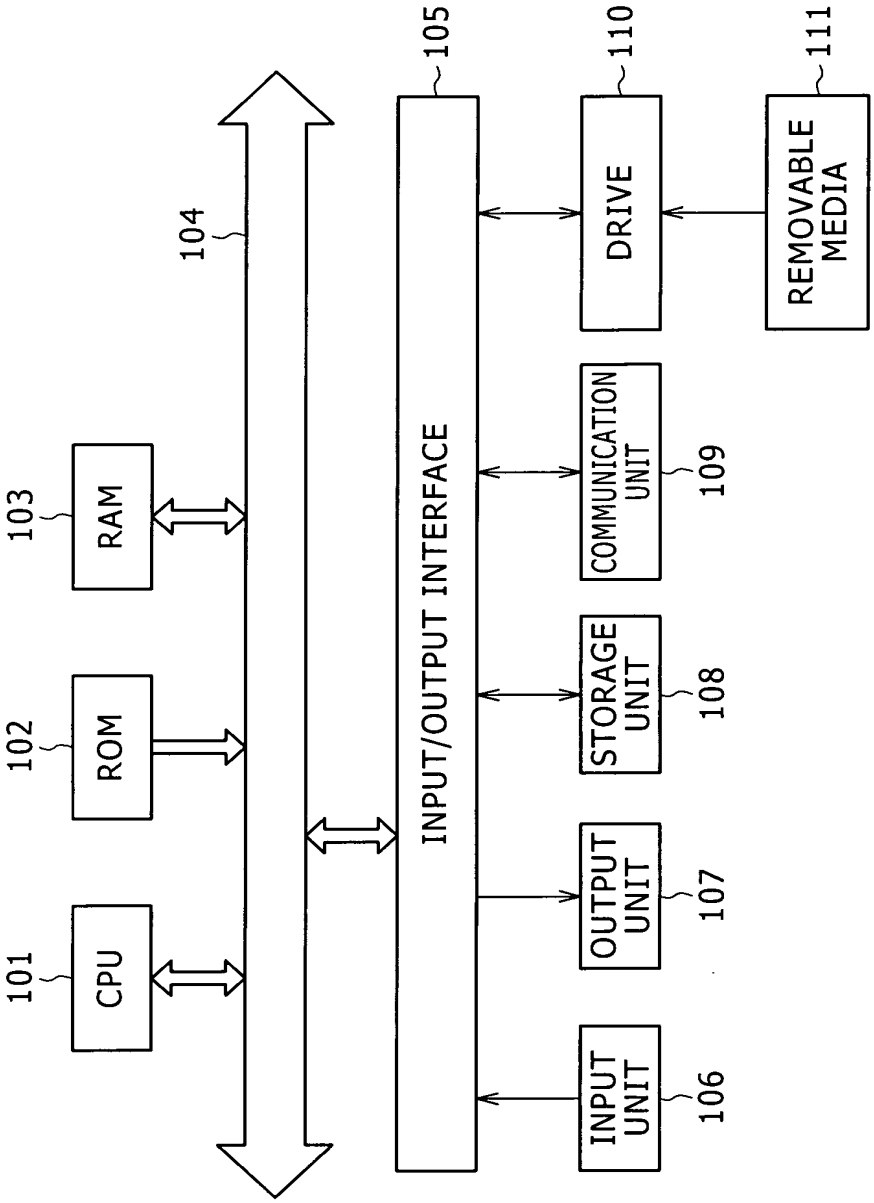

101
CPU
102
ROM
103
RAM
104
105
INPUT/OUTPUT INTERFACE
106
INPUT UNIT
107
OUTPUT UNIT
108
STORAGE UNIT
109
COMMUNICATION UNIT
110
DRIVE
111
REMOVABLE MEDIA

FIG. 3

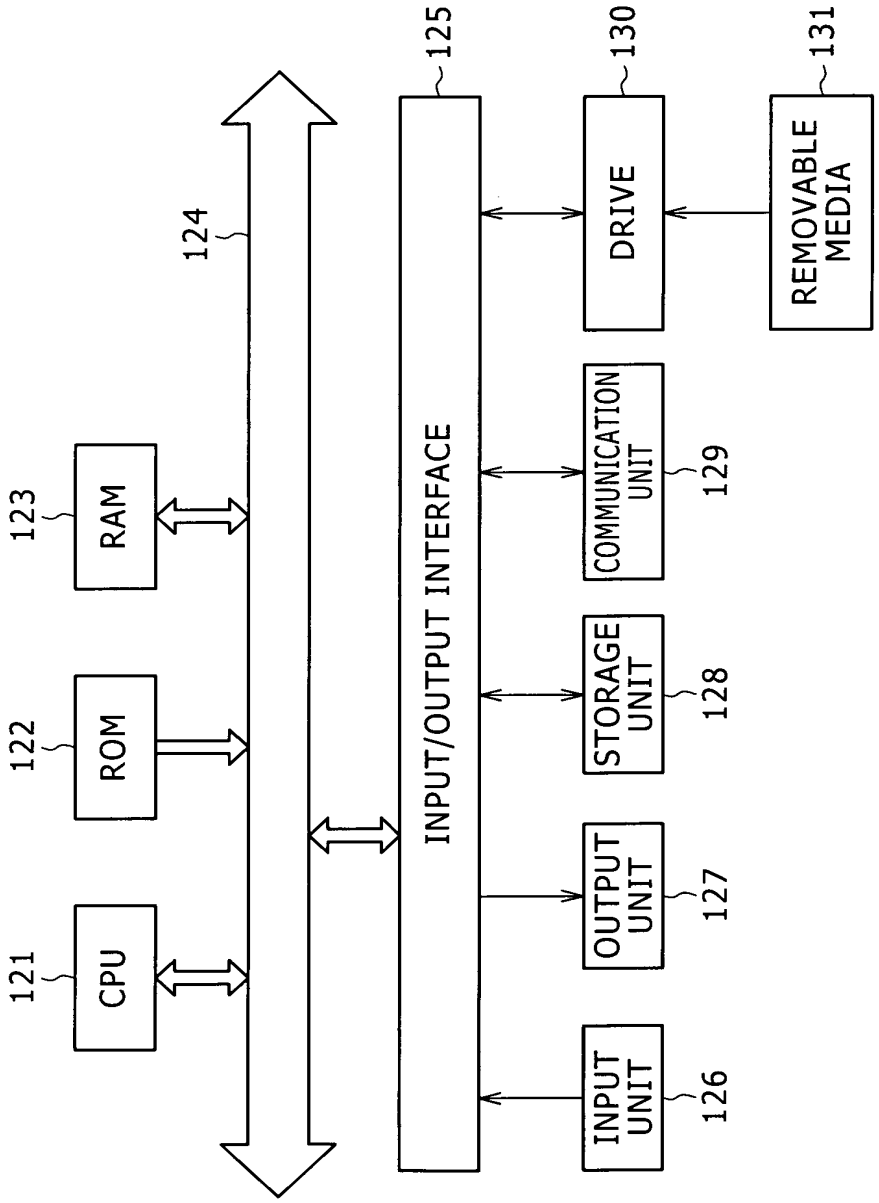

121
CPU
122
ROM
123
RAM
124
125
INPUT/OUTPUT INTERFACE
126
INPUT UNIT
127
OUTPUT UNIT
128
STORAGE UNIT
129
COMMUNICATION UNIT
130
DRIVE
131
REMOVABLE MEDIA

FIG. 4

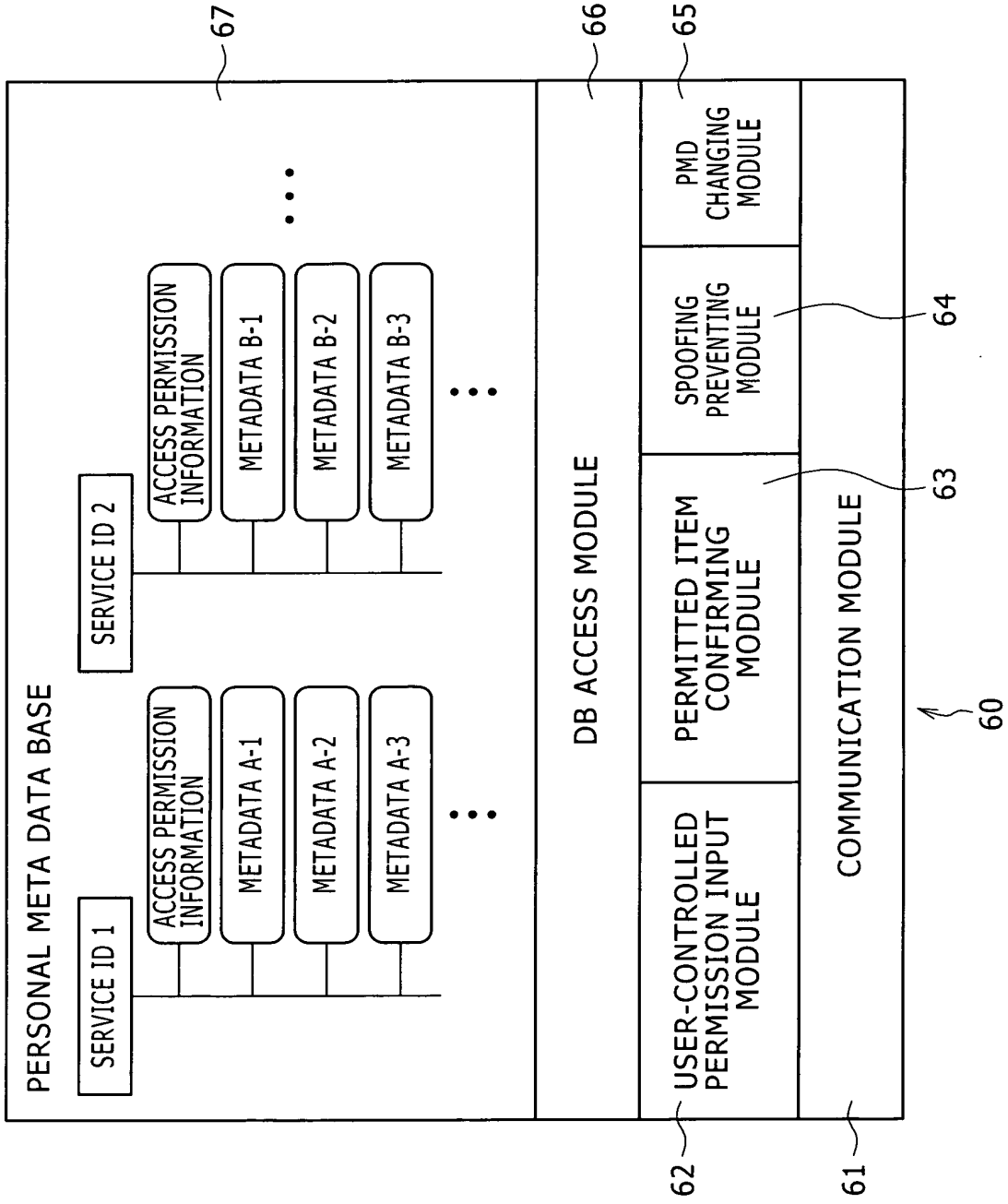

PERSONAL META DATA BASE
SERVICE ID 1
ACCESS PERMISSION INFORMATION
METADATA A-1
METADATA A-2
METADATA A-3
SERVICE ID 2
ACCESS PERMISSION INFORMATION
METADATA B-1
METADATA B-2
METADATA B-3
67
DB ACCESS MODULE
66
PMD CHANGING MODULE
SPOOFING PREVENTING MODULE
PERMITTED ITEM CONFIRMING MODULE
USER-CONTROLLED PERMISSION INPUT MODULE
65
64
63
62
COMMUNICATION MODULE
61
60

FIG. 5

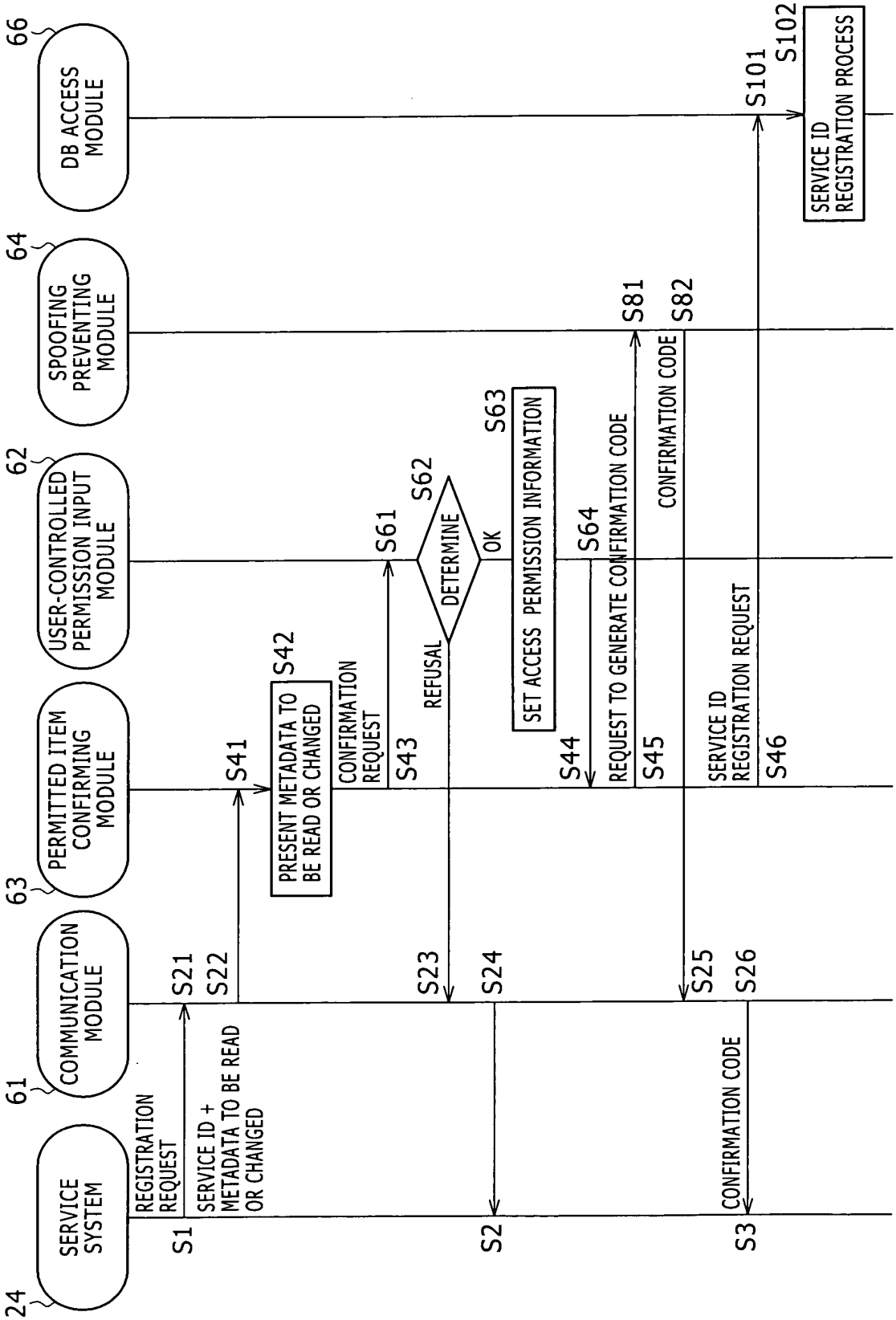

24
SERVICE SYSTEM
61
COMMUNICATION MODULE
63
PERMITTED ITEM CONFIRMING MODULE
62
USER-CONTROLLED PERMISSION INPUT MODULE
64
SPOOFING PREVENTING MODULE
66
DB ACCESS MODULE
REGISTRATION REQUEST
SERVICE ID + METADATA TO BE READ OR CHANGED
S1
S2
S3
S21
S22
S23
S24
S25
S26
S41
PRESENT METADATA TO BE READ OR CHANGED
S42
CONFIRMATION REQUEST
S43
S61
REFUSAL
S62
DETERMINE
OK
S63
SET ACCESS PERMISSION INFORMATION
S64
REQUEST TO GENERATE CONFIRMATION CODE
S44
S45
S81
CONFIRMATION CODE
S82
SERVICE ID REGISTRATION REQUEST
S46
CONFIRMATION CODE
S101
SERVICE ID REGISTRATION PROCESS
S102

FIG. 6

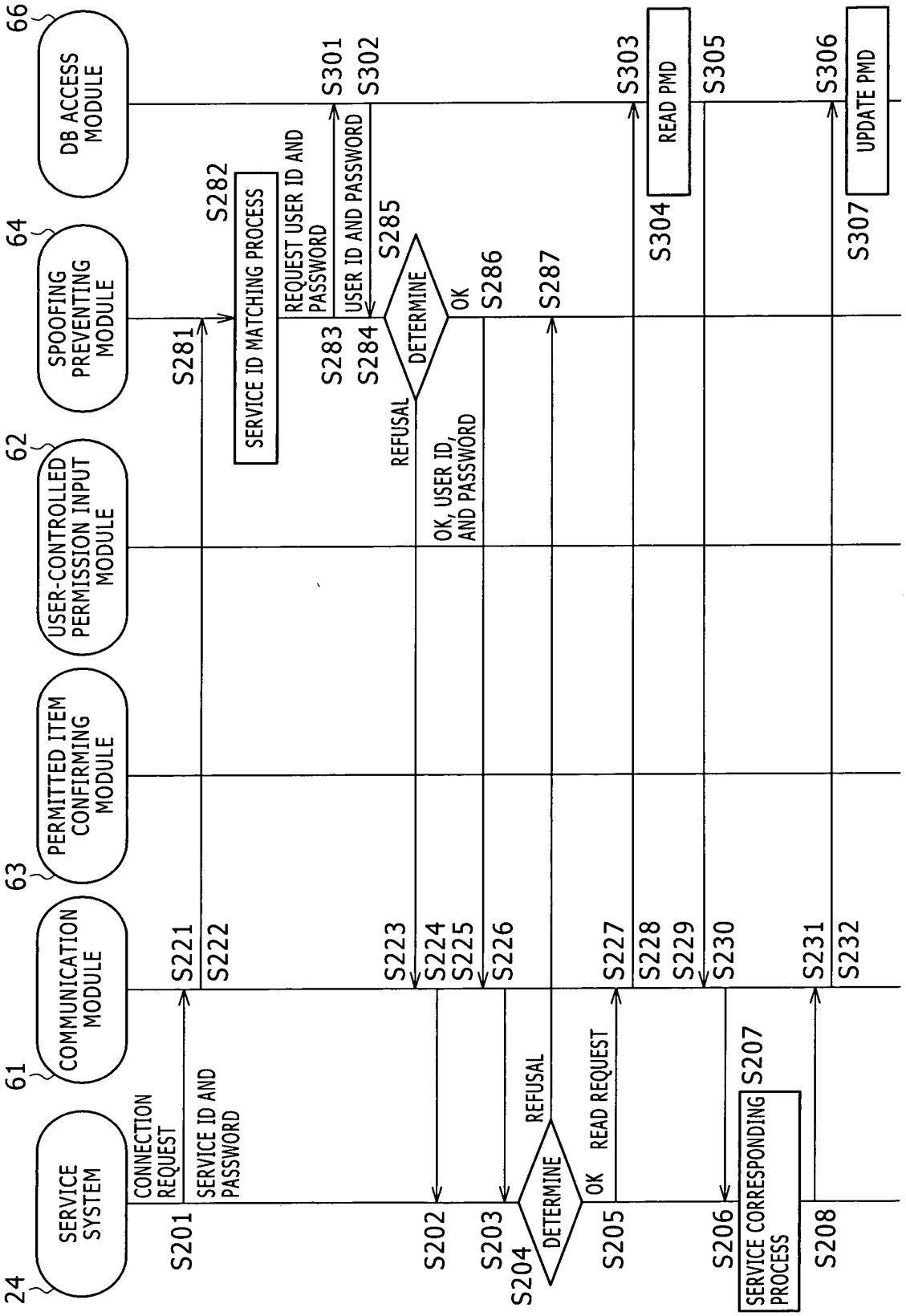

24
SERVICE SYSTEM
61
COMMUNICATION MODULE
63
PERMITTED ITEM CONFIRMING MODULE
62
USER-CONTROLLED PERMISSION INPUT MODULE
64
SPOOFING PREVENTING MODULE
66
DB ACCESS MODULE
CONNECTION REQUEST
SERVICE ID AND PASSWORD
S201
S202
S203
S204
DETERMINE
REFUSAL
OK
READ REQUEST
S205
S206
SERVICE CORRESPONDING PROCESS
S207
S208
S221
S222
S223
S224
S225
S226
S227
S228
S229
S230
S231
S232
S281
SERVICE ID MATCHING PROCESS
S282
REQUEST USER ID AND PASSWORD
S283
USER ID AND PASSWORD
S284
S285
DETERMINE
REFUSAL
OK
S286
OK, USER ID, AND PASSWORD
S287
S301
S302
S303
READ PMD
S304
S305
S306
UPDATE PMD
S307

FIG. 7

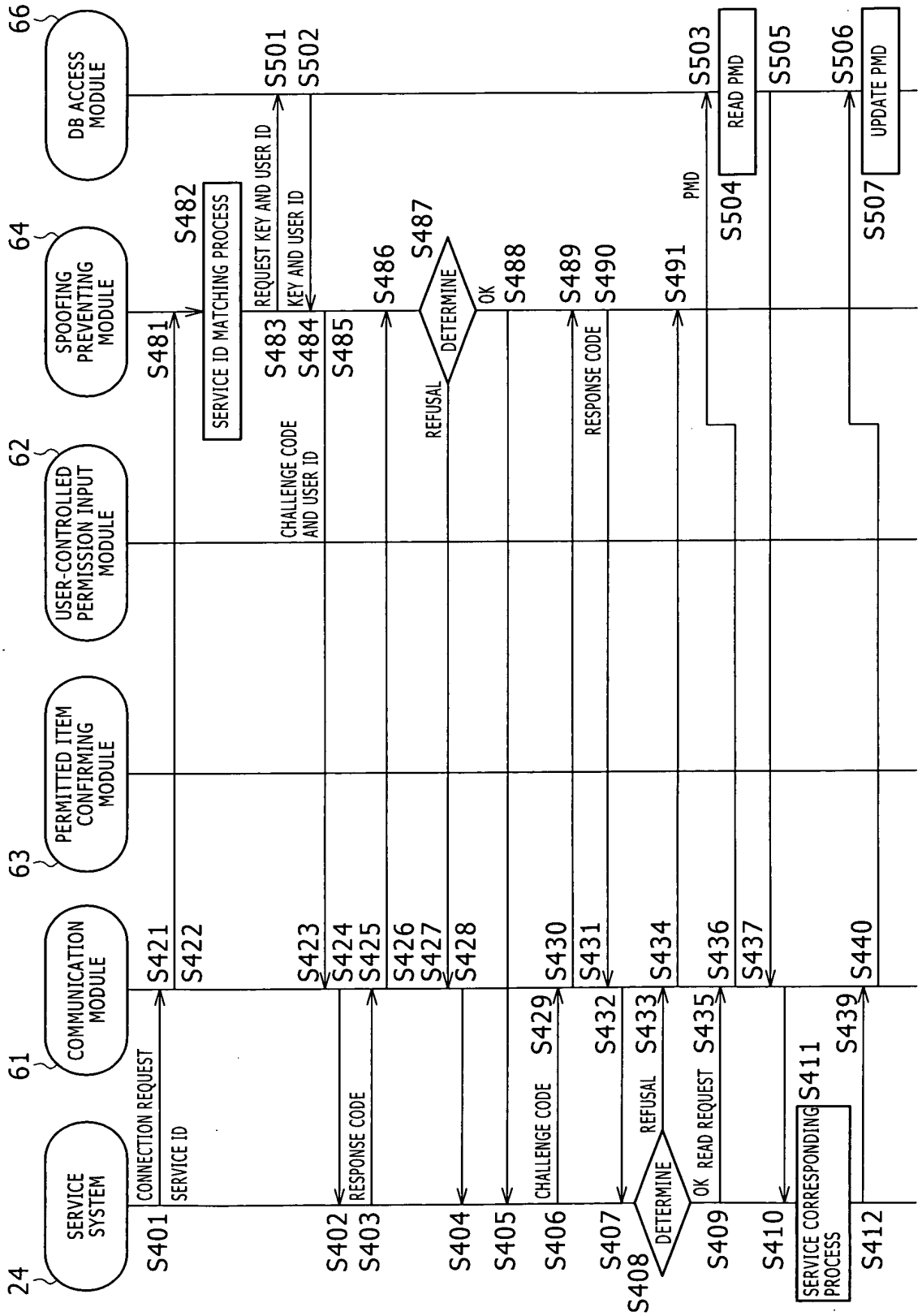

24
SERVICE SYSTEM
61
COMMUNICATION MODULE
63
PERMITTED ITEM CONFIRMING MODULE
62
USER-CONTROLLED PERMISSION INPUT MODULE
64
SPOOFING PREVENTING MODULE
66
DB ACCESS MODULE
CONNECTION REQUEST
SERVICE ID
RESPONSE CODE
CHALLENGE CODE
REFUSAL
OK
READ REQUEST
SERVICE CORRESPONDING PROCESS
SERVICE ID MATCHING PROCESS
REQUEST KEY AND USER ID
KEY AND USER ID
CHALLENGE CODE AND USER ID
DETERMINE
RESPONSE CODE
PMD
READ PMD
UPDATE PMD
S401
S402
S403
S404
S405
S406
S407
S408
S409
S410
S411
S412
S421
S422
S423
S424
S425
S426
S427
S428
S429
S430
S431
S432
S433
S434
S435
S436
S437
S439
S440
S481
S482
S483
S484
S485
S486
S487
S488
S489
S490
S491
S501
S502
S503
S504
S505
S506
S507

FIG. 8

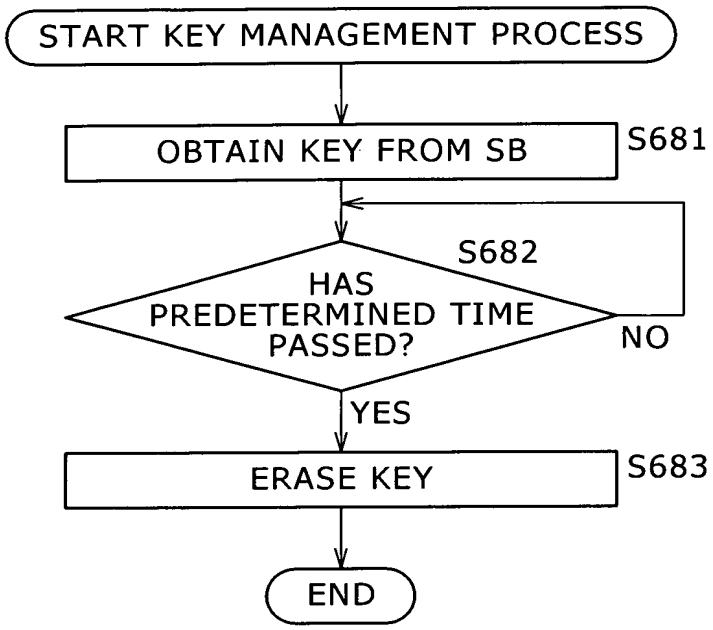

START KEY MANAGEMENT PROCESS
OBTAIN KEY FROM SB
S681
S682
HAS PREDETERMINED TIME PASSED?
NO
YES
ERASE KEY
S683
END

FIG. 9

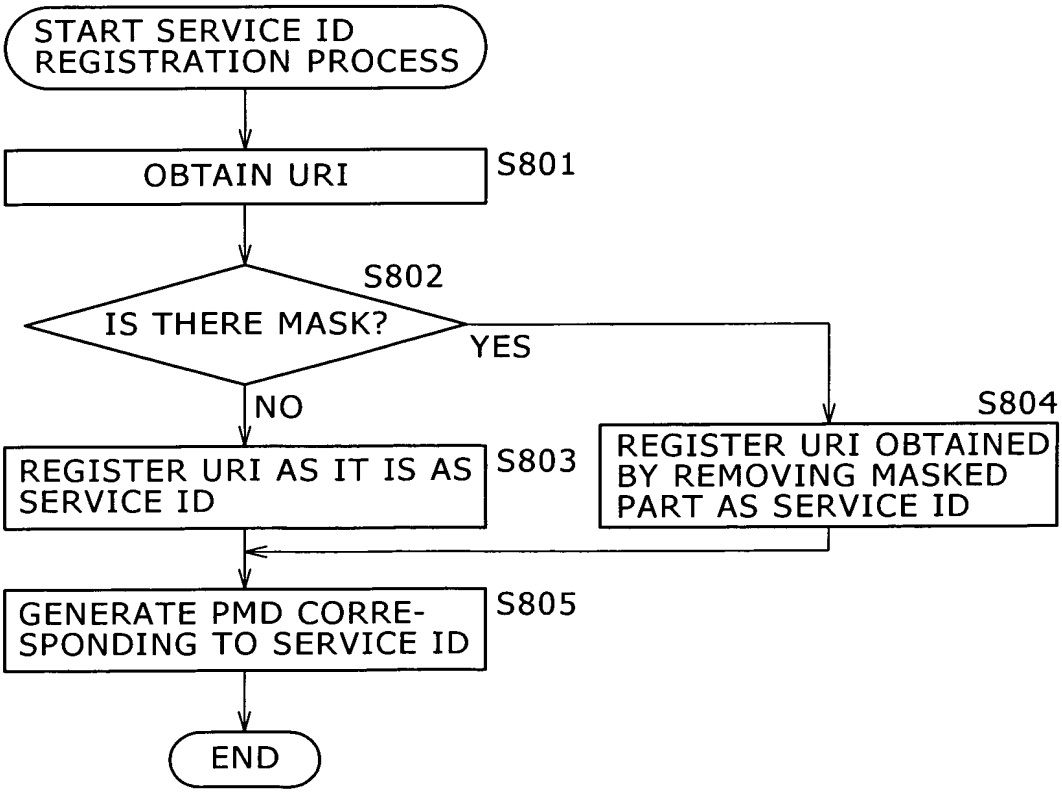

START SERVICE ID REGISTRATION PROCESS
OBTAIN URI
S801
S802
IS THERE MASK?
YES
NO
REGISTER URI AS IT IS AS SERVICE ID
S803
S804
REGISTER URI OBTAINED BY REMOVING MASKED PART AS SERVICE ID
GENERATE PMD CORRE-SPONDING TO SERVICE ID
S805
END

FIG. 10

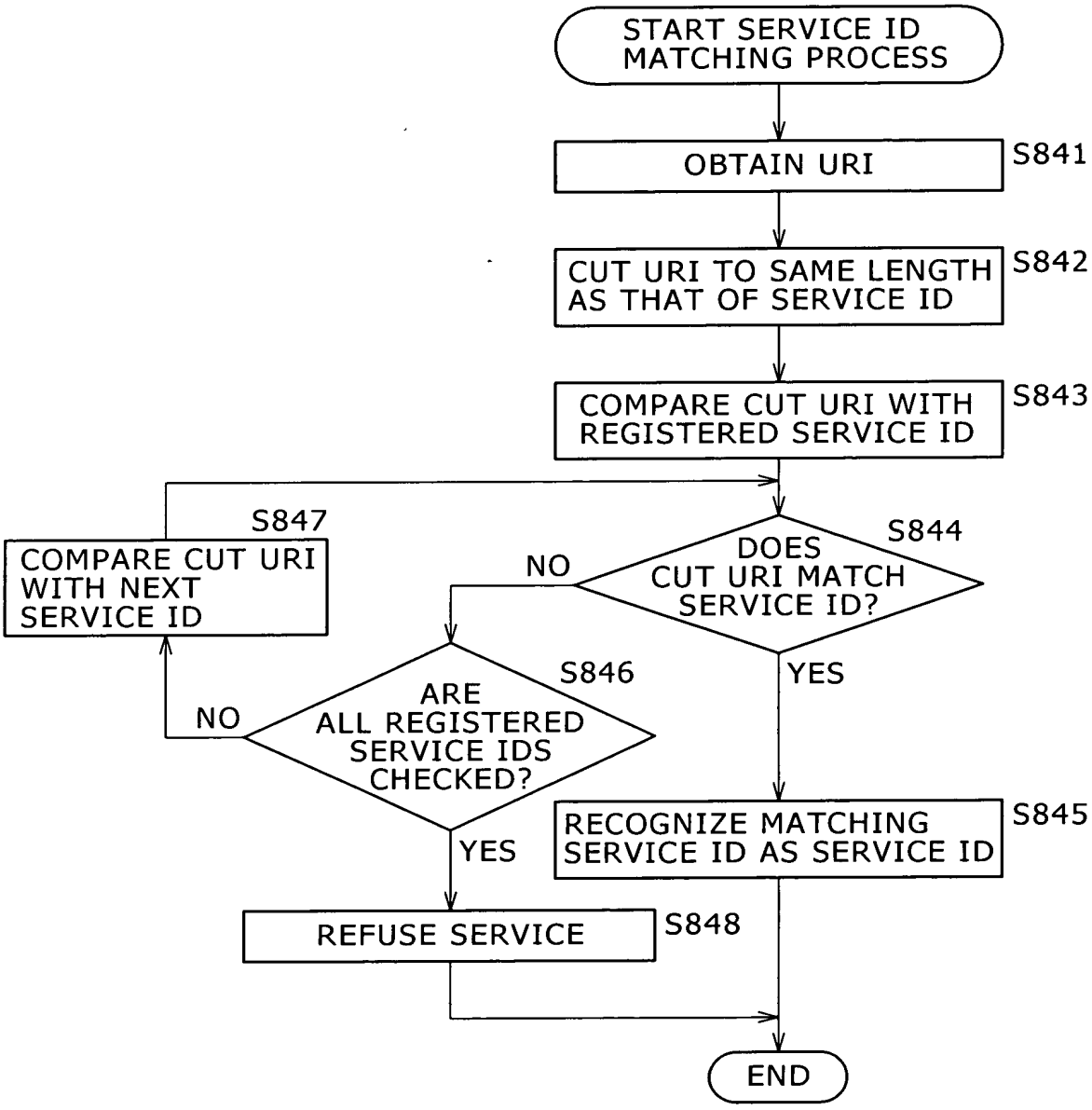

START SERVICE ID MATCHING PROCESS
OBTAIN URI
S841
CUT URI TO SAME LENGTH AS THAT OF SERVICE ID
S842
COMPARE CUT URI WITH REGISTERED SERVICE ID
S843
DOES CUT URI MATCH SERVICE ID?
S844
NO
YES
COMPARE CUT URI WITH NEXT SERVICE ID
S847
ARE ALL REGISTERED SERVICE IDS CHECKED?
S846
NO
YES
RECOGNIZE MATCHING SERVICE ID AS SERVICE ID
S845
REFUSE SERVICE
S848
END

FIG. 11A

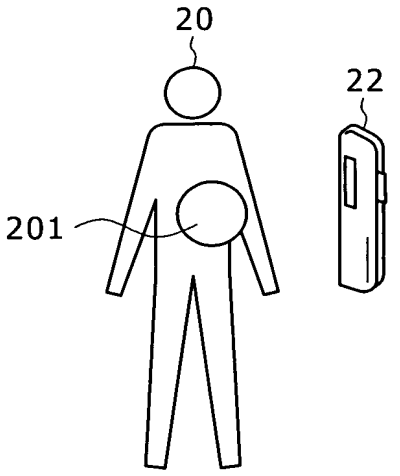


FIG. 11B

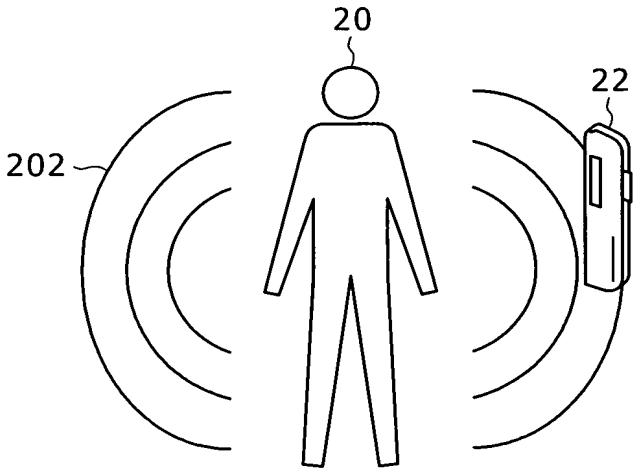


FIG. 12

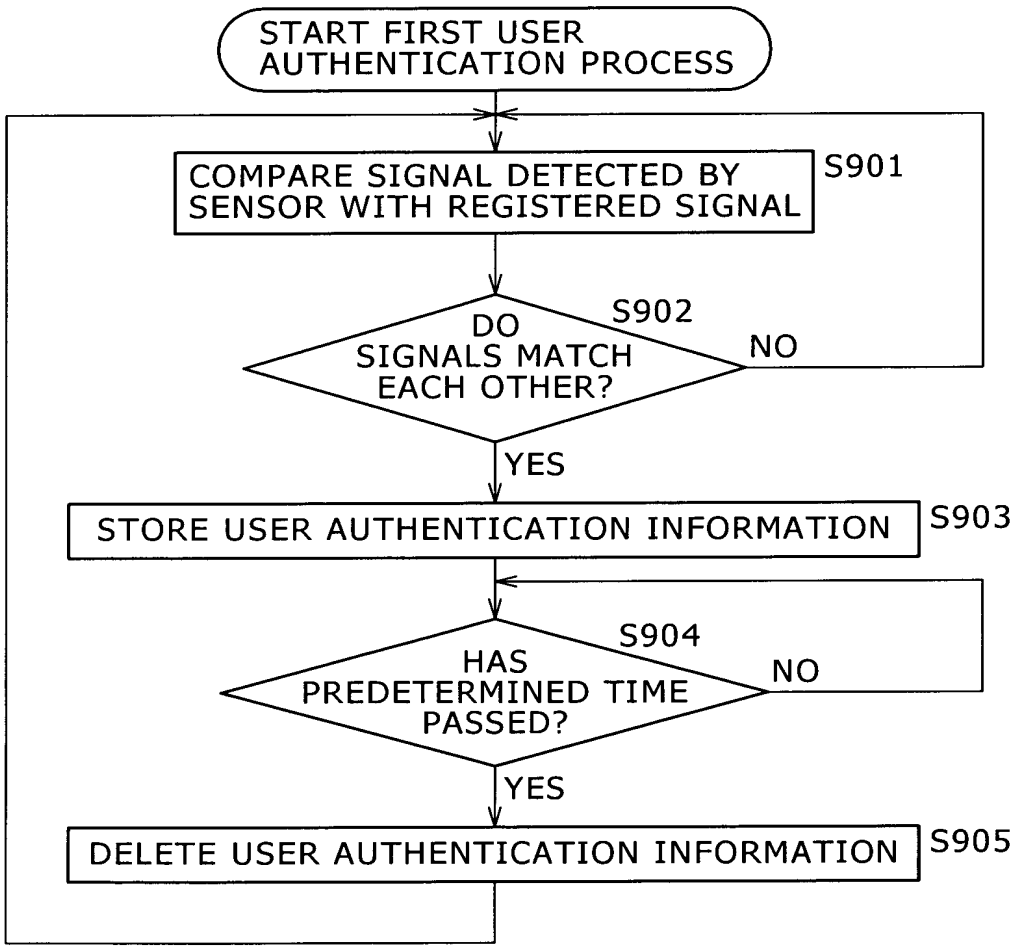

START FIRST USER AUTHENTICATION PROCESS
COMPARE SIGNAL DETECTED BY SENSOR WITH REGISTERED SIGNAL
S901
DO SIGNALS MATCH EACH OTHER?
S902
NO
YES
STORE USER AUTHENTICATION INFORMATION
S903
HAS PREDETERMINED TIME PASSED?
S904
NO
YES
DELETE USER AUTHENTICATION INFORMATION
S905

FIG. 13

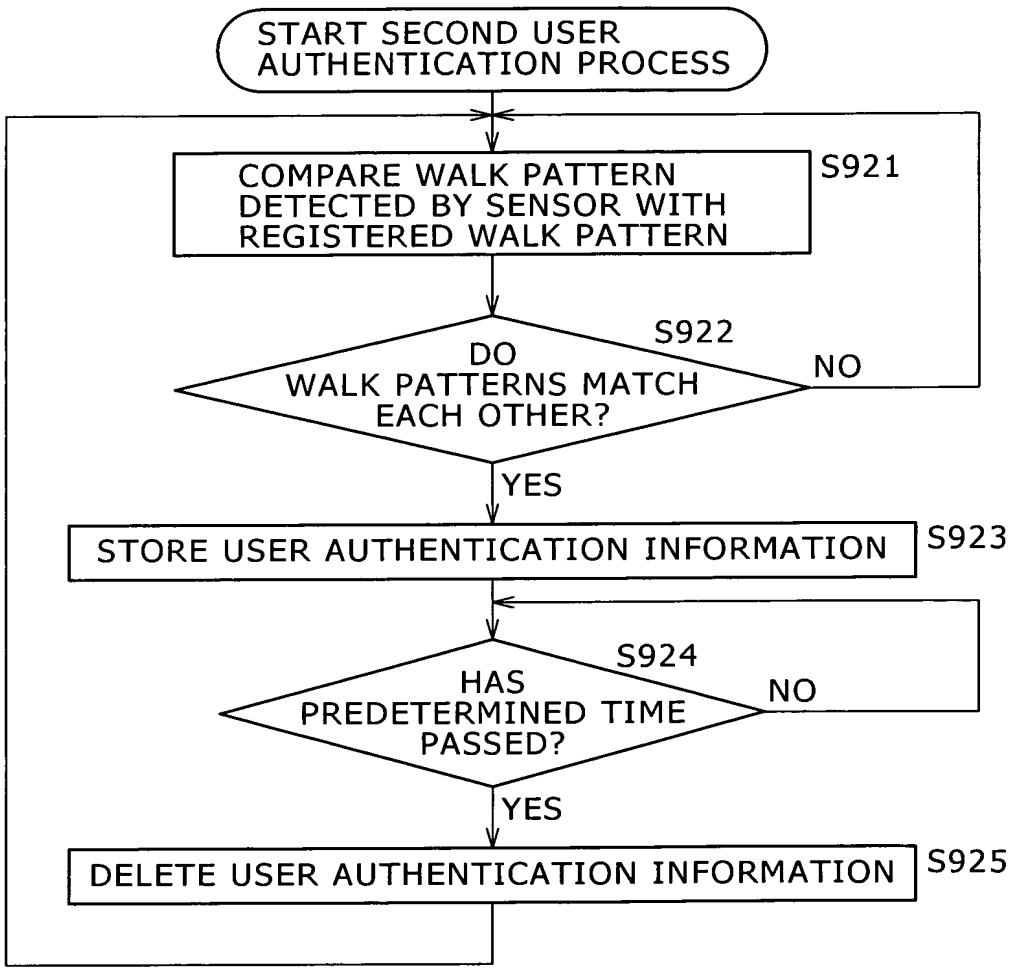

START SECOND USER AUTHENTICATION PROCESS
COMPARE WALK PATTERN DETECTED BY SENSOR WITH REGISTERED WALK PATTERN
S921
DO WALK PATTERNS MATCH EACH OTHER?
S922
NO
YES
STORE USER AUTHENTICATION INFORMATION
S923
HAS PREDETERMINED TIME PASSED?
S924
NO
YES
DELETE USER AUTHENTICATION INFORMATION
S925

FIG. 14

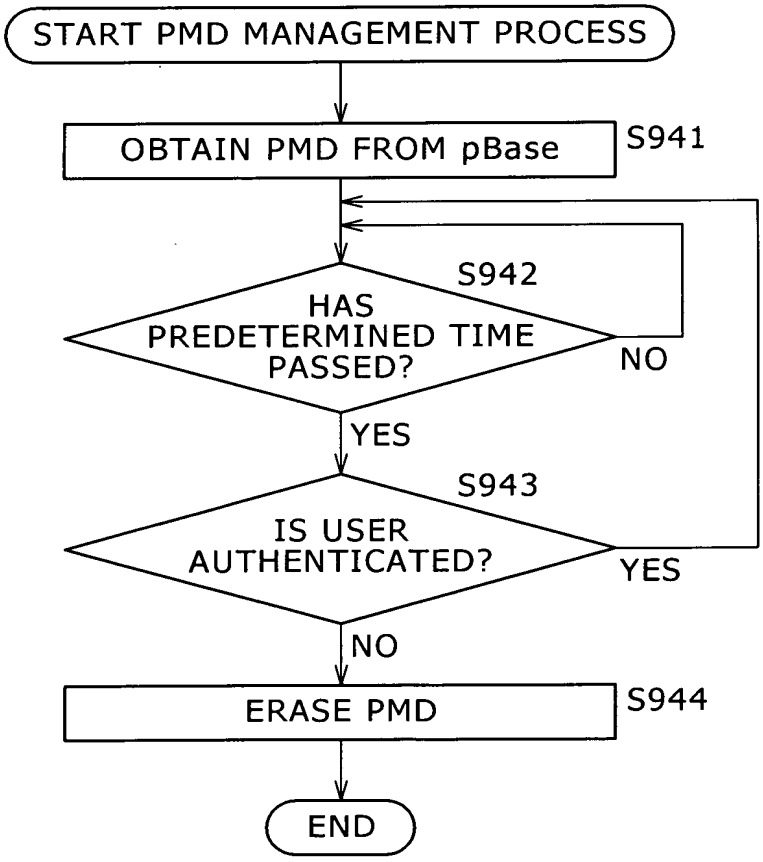

START PMD MANAGEMENT PROCESS
OBTAIN PMD FROM pBase
S941
S942
HAS PREDETERMINED TIME PASSED?
NO
YES
S943
IS USER AUTHENTICATED?
YES
NO
ERASE PMD
S944
END

FIG. 15

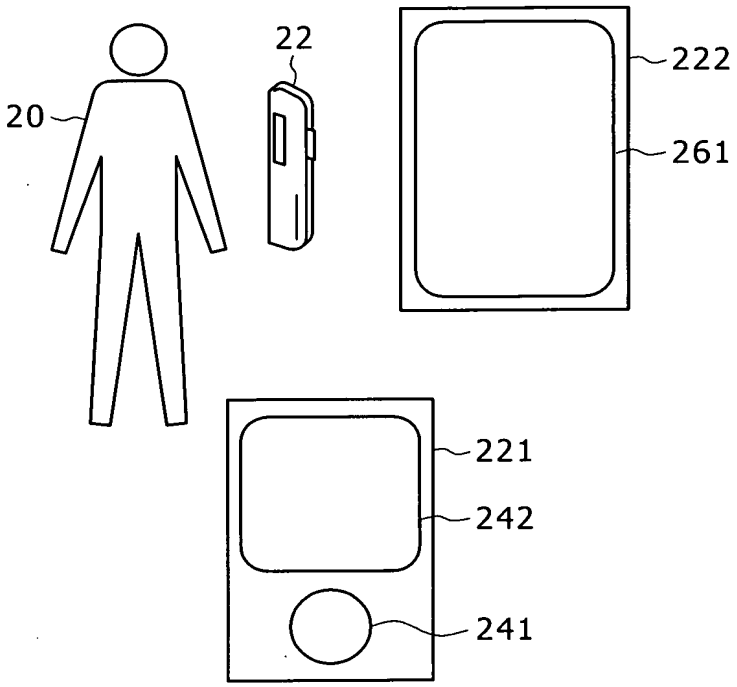

22
20
222
261
221
242
241

FIG. 16

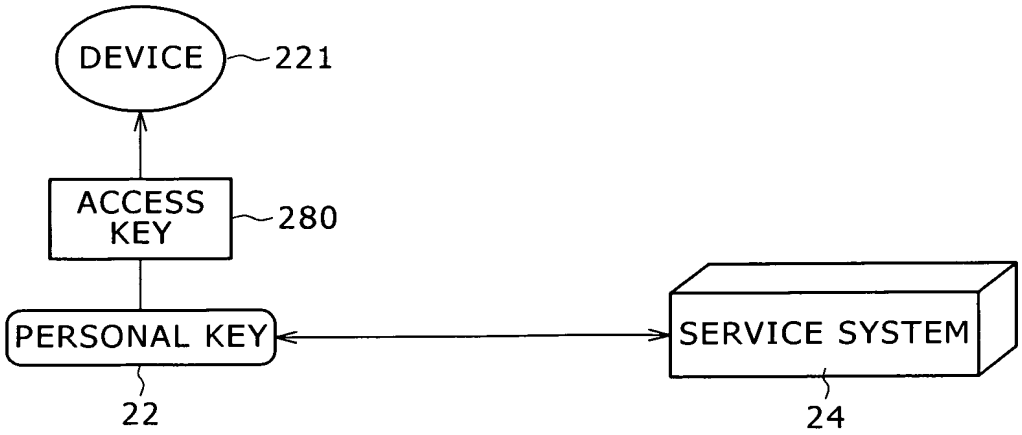

DEVICE
221
ACCESS KEY
280
PERSONAL KEY
22
SERVICE SYSTEM
24

FIG. 17A

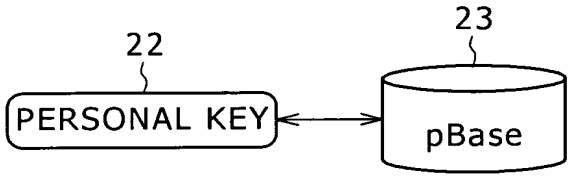


FIG. 17B

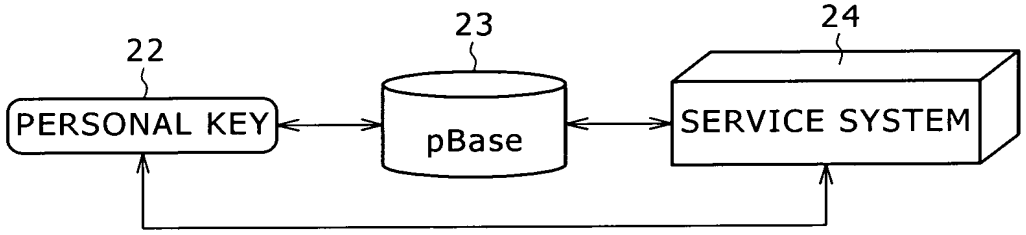


FIG. 17C

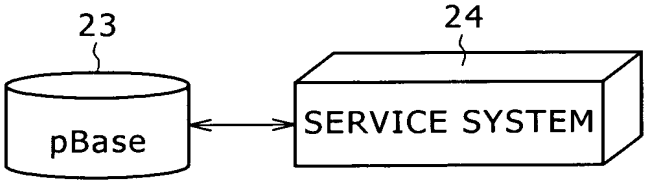


FIG. 18

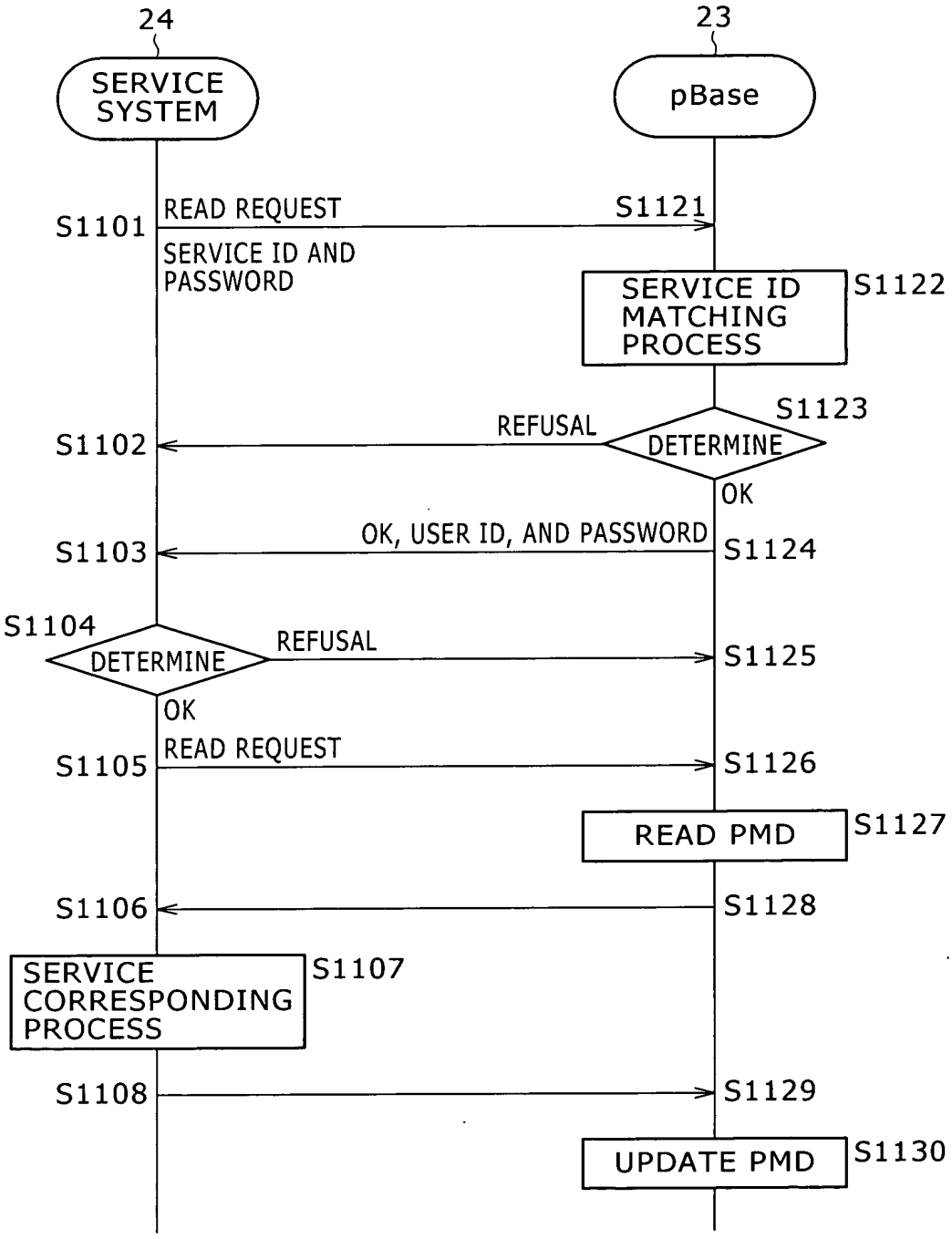

24
SERVICE SYSTEM
23
pBase
S1101
READ REQUEST
SERVICE ID AND PASSWORD
S1121
SERVICE ID MATCHING PROCESS
S1122
S1123
REFUSAL
DETERMINE
S1102
OK
OK, USER ID, AND PASSWORD
S1103
S1124
S1104
DETERMINE
REFUSAL
S1125
OK
READ REQUEST
S1105
S1126
READ PMD
S1127
S1106
S1128
SERVICE CORRESPONDING PROCESS
S1107
S1108
S1129
UPDATE PMD
S1130

FIG. 19

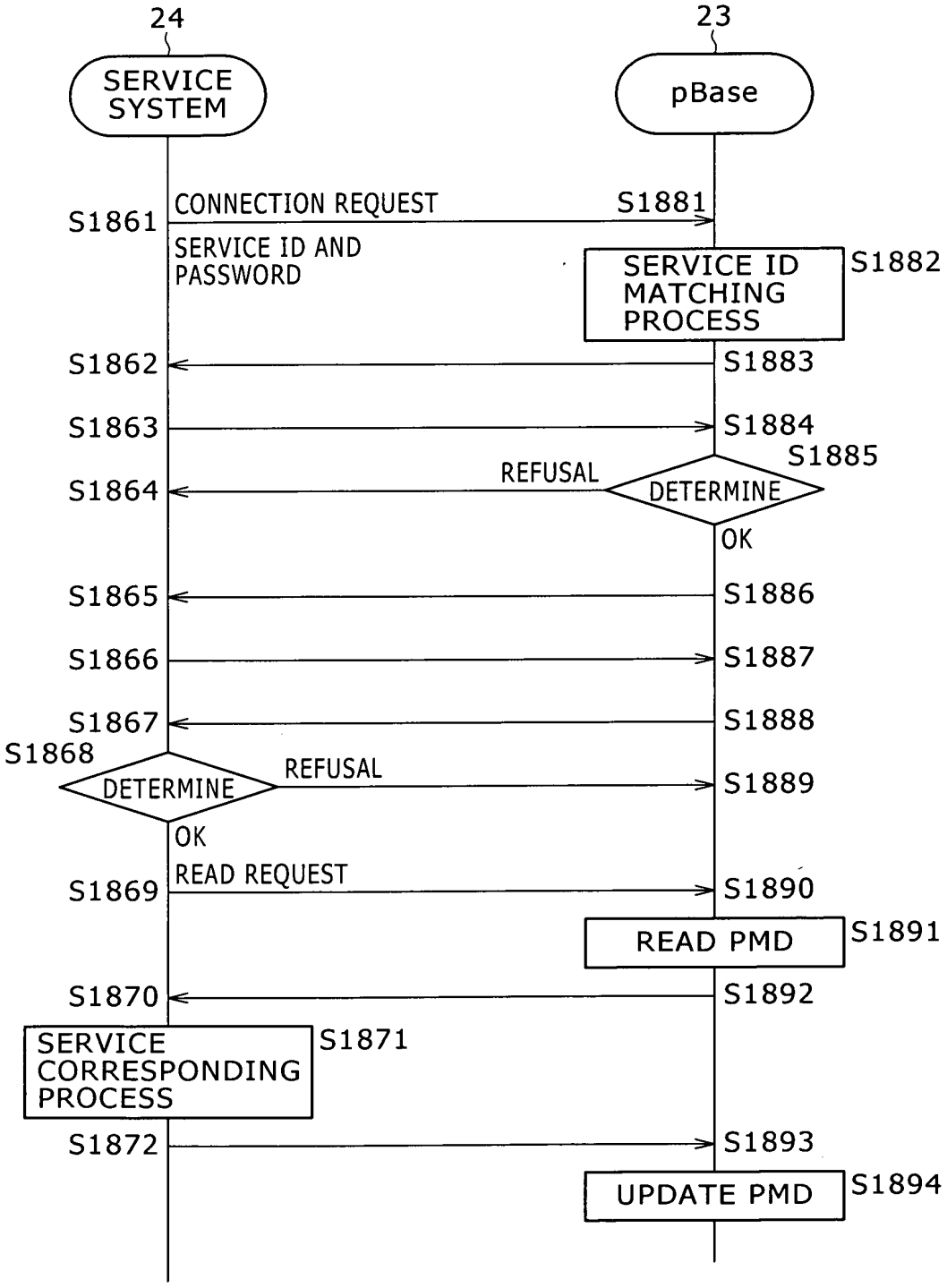

24
23
SERVICE SYSTEM
pBase
S1861
CONNECTION REQUEST
S1881
SERVICE ID AND PASSWORD
SERVICE ID MATCHING PROCESS
S1882
S1862
S1883
S1863
S1884
S1885
REFUSAL
S1864
DETERMINE
OK
S1865
S1886
S1866
S1887
S1867
S1888
S1868
DETERMINE
REFUSAL
S1889
OK
READ REQUEST
S1869
S1890
READ PMD
S1891
S1870
S1892
SERVICE CORRESPONDING PROCESS
S1871
S1872
S1893
UPDATE PMD
S1894

FIG.20A

PROPERTY	CONTENTS	ACCESS CONTROL
NAME	FOO	CONTROL INFORMATION
SPOOFING PREVENTING METHOD	PUBLIC KEY SYSTEM	CONTROL INFORMATION
SERVICE PUBLIC KEY	KEY DATA	CONTROL INFORMATION
PK PRIVATE KEY	KEY DATA	CONTROL INFORMATION
ACTION	PROGRAM	CONTROL INFORMATION
PROGRAM PREFERENCE INFORMATION	SPORTS 10, VARIETY 7, MUSIC 5, AND OTHERS 3	CONTROL INFORMATION

• • •

FIG. 20B

PROPERTY	CONTENTS	ACCESS CONTROL
NAME	FOO	CONTROL INFORMATION
SPOOFING PREVENTING METHOD	COMMON KEY SYSTEM	CONTROL INFORMATION
COMMON KEY	KEY DATA	CONTROL INFORMATION
ACTION	PROGRAM	CONTROL INFORMATION
PROGRAM PREFERENCE INFORMATION	SPORTS 10, VARIETY 7, MUSIC 5, AND OTHERS 3	CONTROL INFORMATION
⋮	⋮	⋮

FIG.20C

PROPERTY	CONTENTS	ACCESS CONTROL
NAME	FOO	CONTROL INFORMATION
SPOOFING PREVENTING METHOD	PASSWORD SYSTEM	CONTROL INFORMATION
SERVICE PASSWORD	PASSWORD DATA	CONTROL INFORMATION
PK PASSWORD	PASSWORD DATA	CONTROL INFORMATION
ACTION	PROGRAM	CONTROL INFORMATION
PROGRAM PREFERENCE INFORMATION	SPORTS 10, VARIETY 7, MUSIC 5, AND OTHERS 3	CONTROL INFORMATION
⋮	⋮	⋮

FIG. 21

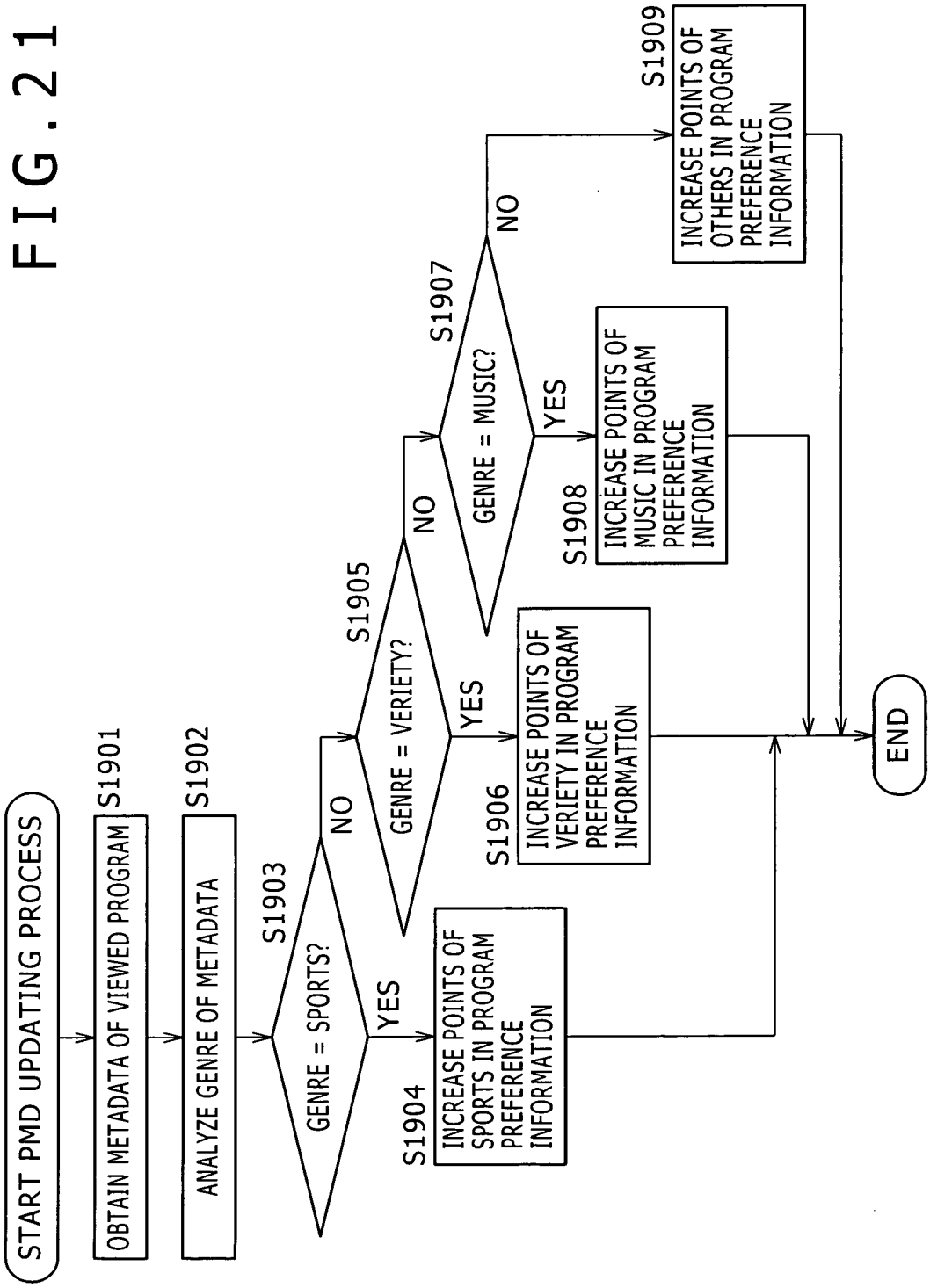

START PMD UPDATING PROCESS
S1901
OBTAIN METADATA OF VIEWED PROGRAM
S1902
ANALYZE GENRE OF METADATA
S1903
GENRE = SPORTS?
YES
NO
S1904
INCREASE POINTS OF SPORTS IN PROGRAM PREFERENCE INFORMATION
S1905
GENRE = VERIETY?
YES
NO
S1906
INCREASE POINTS OF VERIETY IN PROGRAM PREFERENCE INFORMATION
S1907
GENRE = MUSIC?
YES
NO
S1908
INCREASE POINTS OF MUSIC IN PROGRAM PREFERENCE INFORMATION
S1909
INCREASE POINTS OF OTHERS IN PROGRAM PREFERENCE INFORMATION
END

FIG. 22

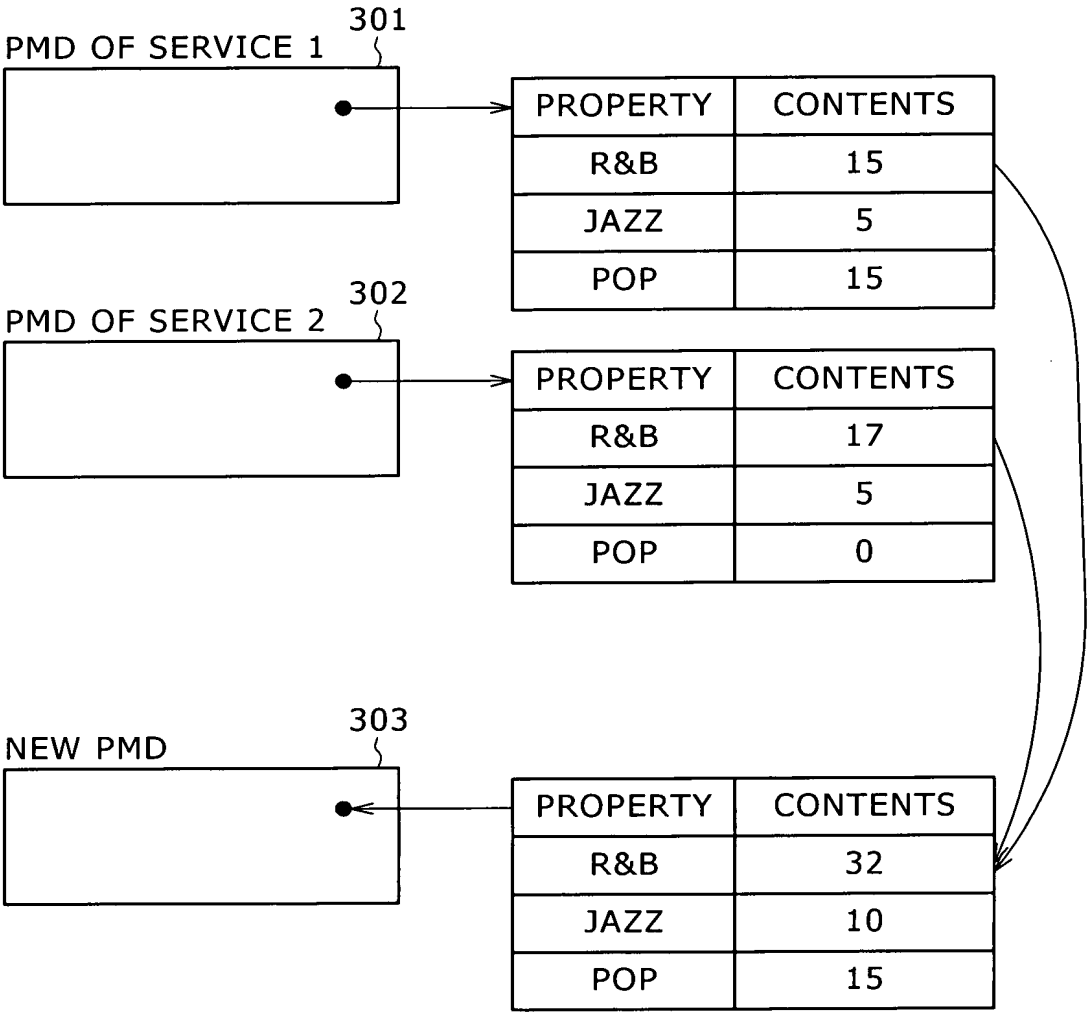

301
PMD OF SERVICE 1
PROPERTY
CONTENTS
R&B
15
JAZZ
5
POP
15
302
PMD OF SERVICE 2
PROPERTY
CONTENTS
R&B
17
JAZZ
5
POP
0
303
NEW PMD
PROPERTY
CONTENTS
R&B
32
JAZZ
10
POP
15

FIG. 23

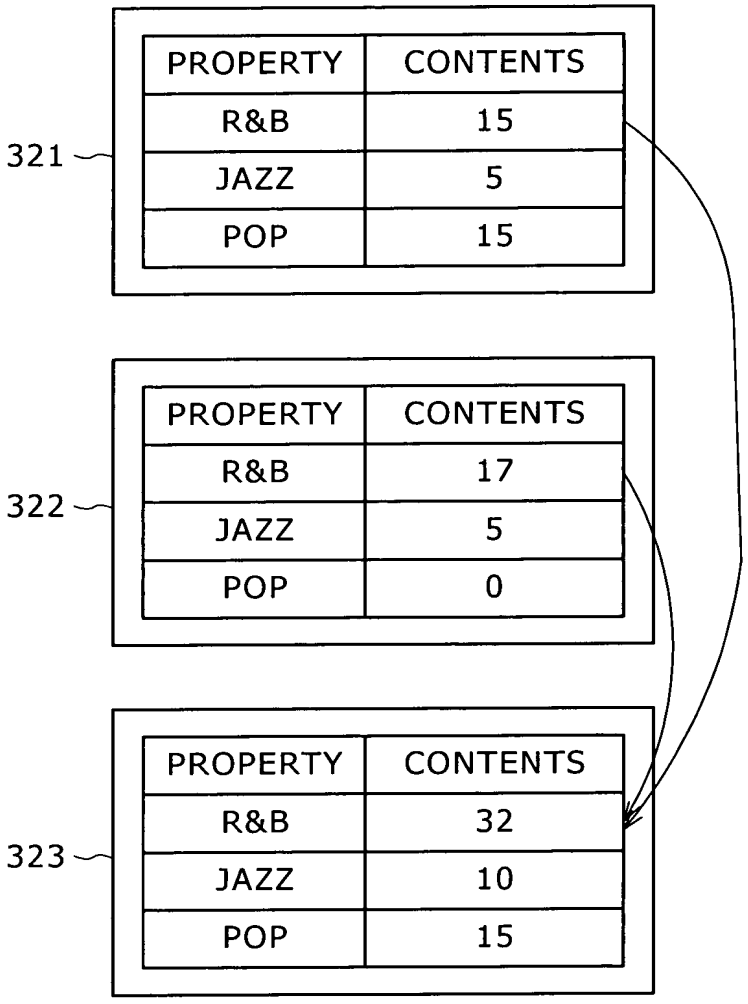
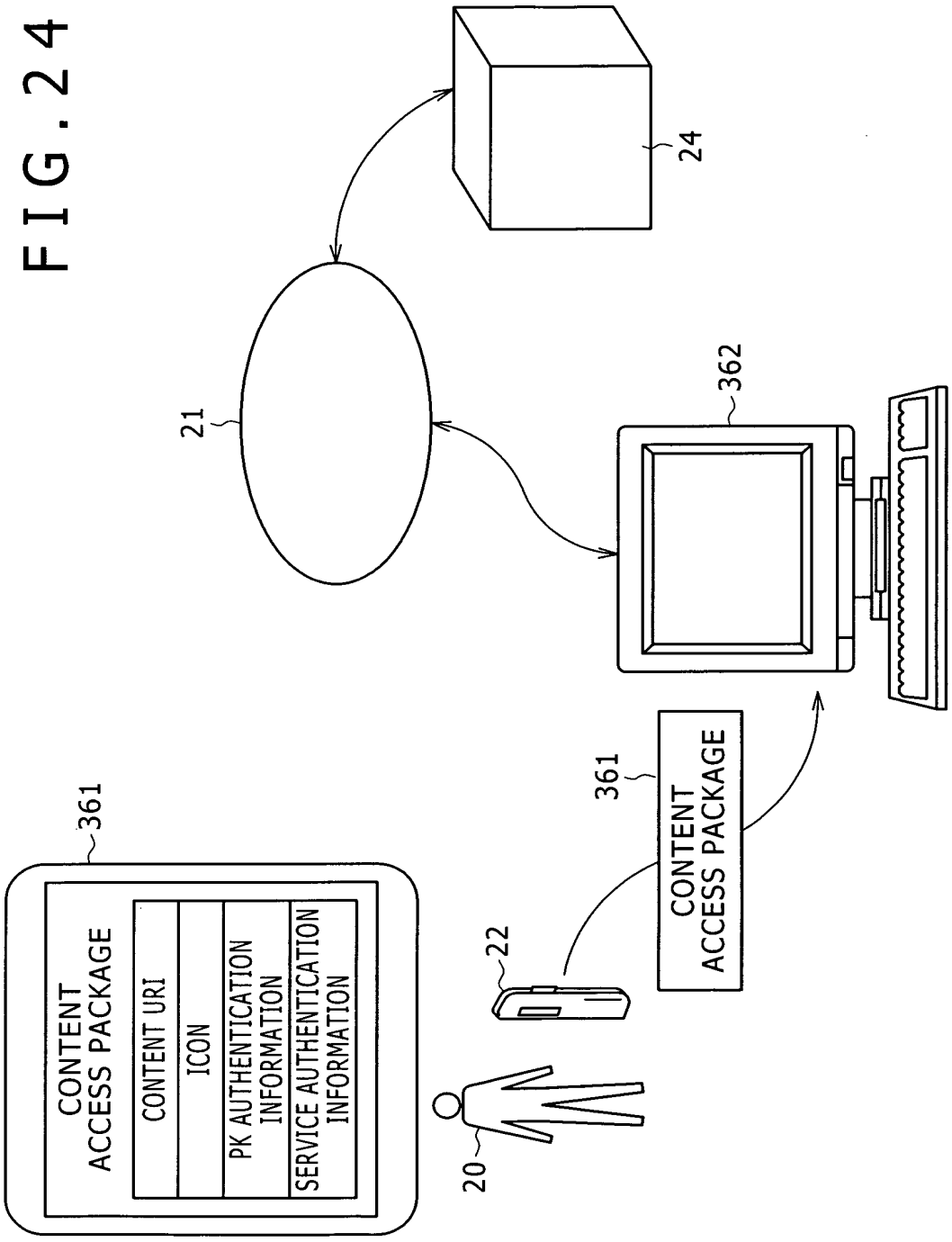

321
PROPERTY
CONTENTS
R&B
15
JAZZ
5
POP
15
322
PROPERTY
CONTENTS
R&B
17
JAZZ
5
POP
0
323
PROPERTY
CONTENTS
R&B
32
JAZZ
10
POP
15

FIG. 24


24
21
362
361
CONTENT ACCESS PACKAGE
22
20
361
CONTENT ACCESS PACKAGE
CONTENT URI
ICON
PK AUTHENTICATION INFORMATION
SERVICE AUTHENTICATION INFORMATION

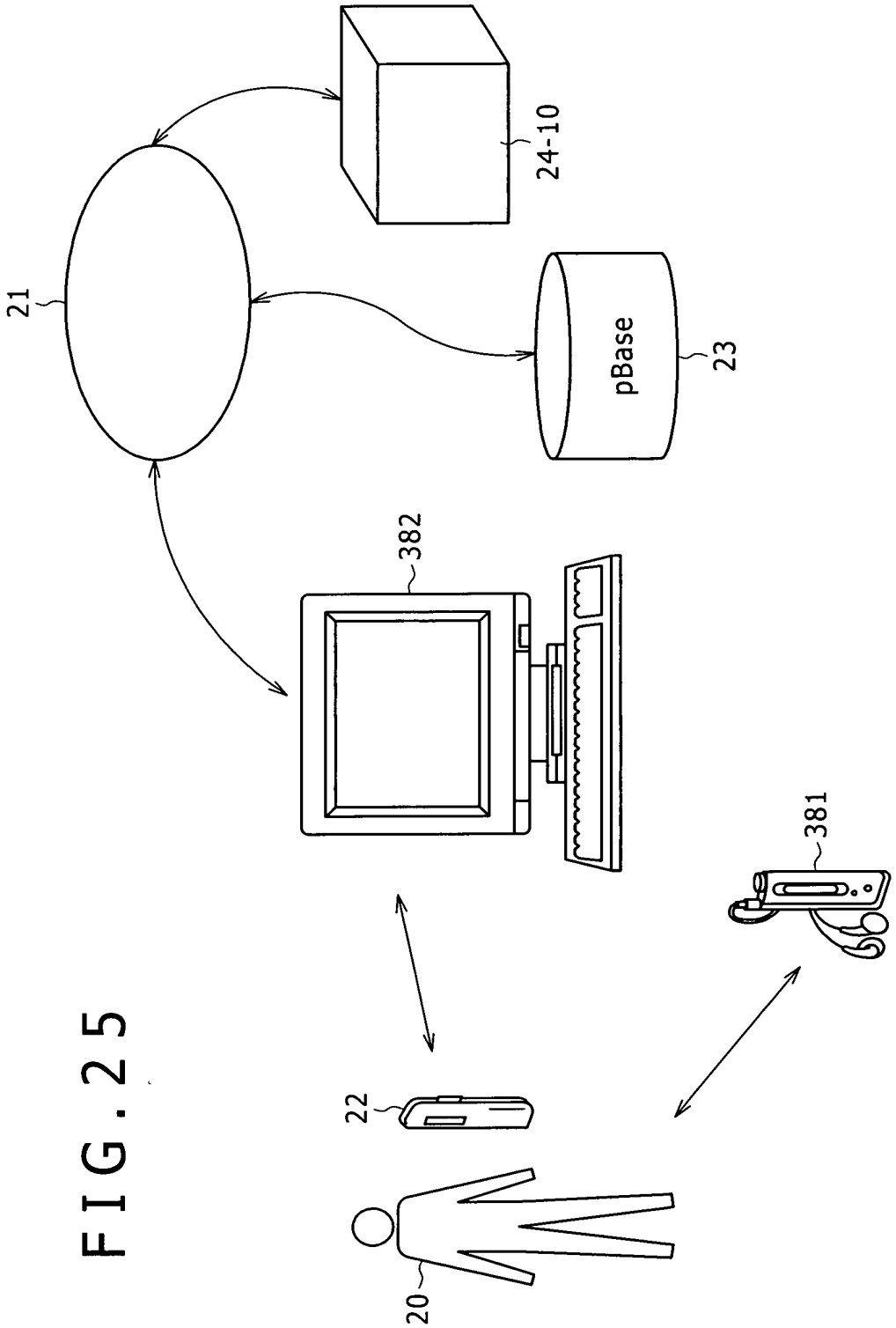


FIG. 25

FIG. 26

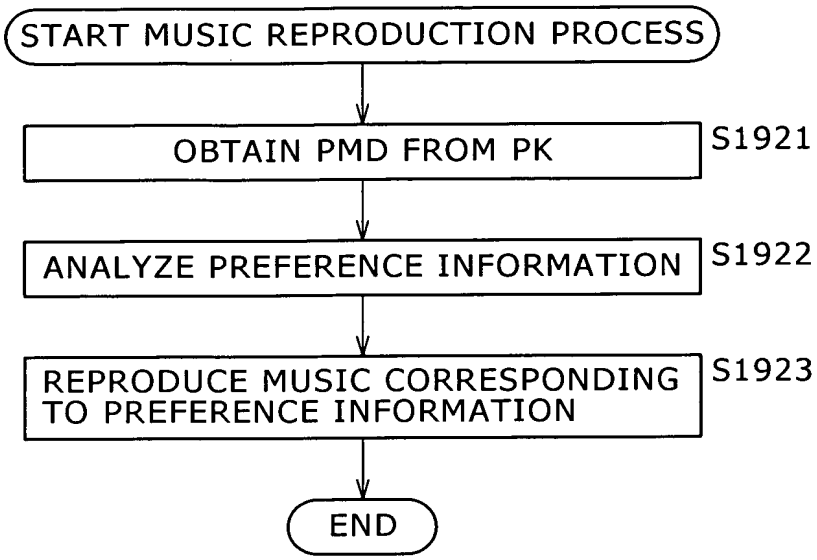

START MUSIC REPRODUCTION PROCESS
OBTAIN PMD FROM PK
S1921
ANALYZE PREFERENCE INFORMATION
S1922
REPRODUCE MUSIC CORRESPONDING TO PREFERENCE INFORMATION
S1923
END

FIG. 27

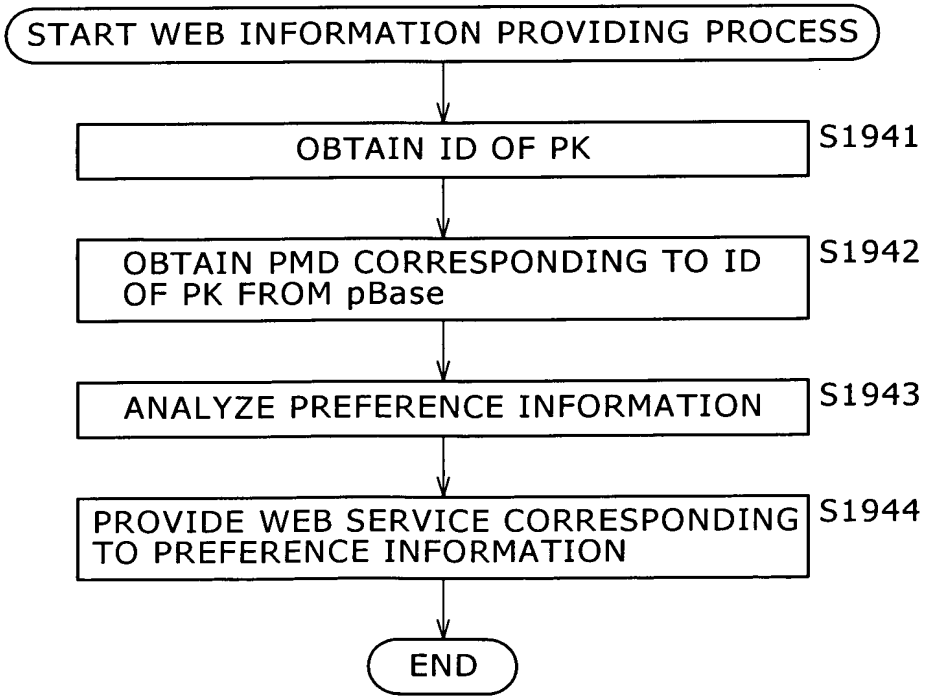

START WEB INFORMATION PROVIDING PROCESS
OBTAIN ID OF PK
S1941
OBTAIN PMD CORRESPONDING TO ID OF PK FROM pBase
S1942
ANALYZE PREFERENCE INFORMATION
S1943
PROVIDE WEB SERVICE CORRESPONDING TO PREFERENCE INFORMATION
S1944
END

FIG. 28

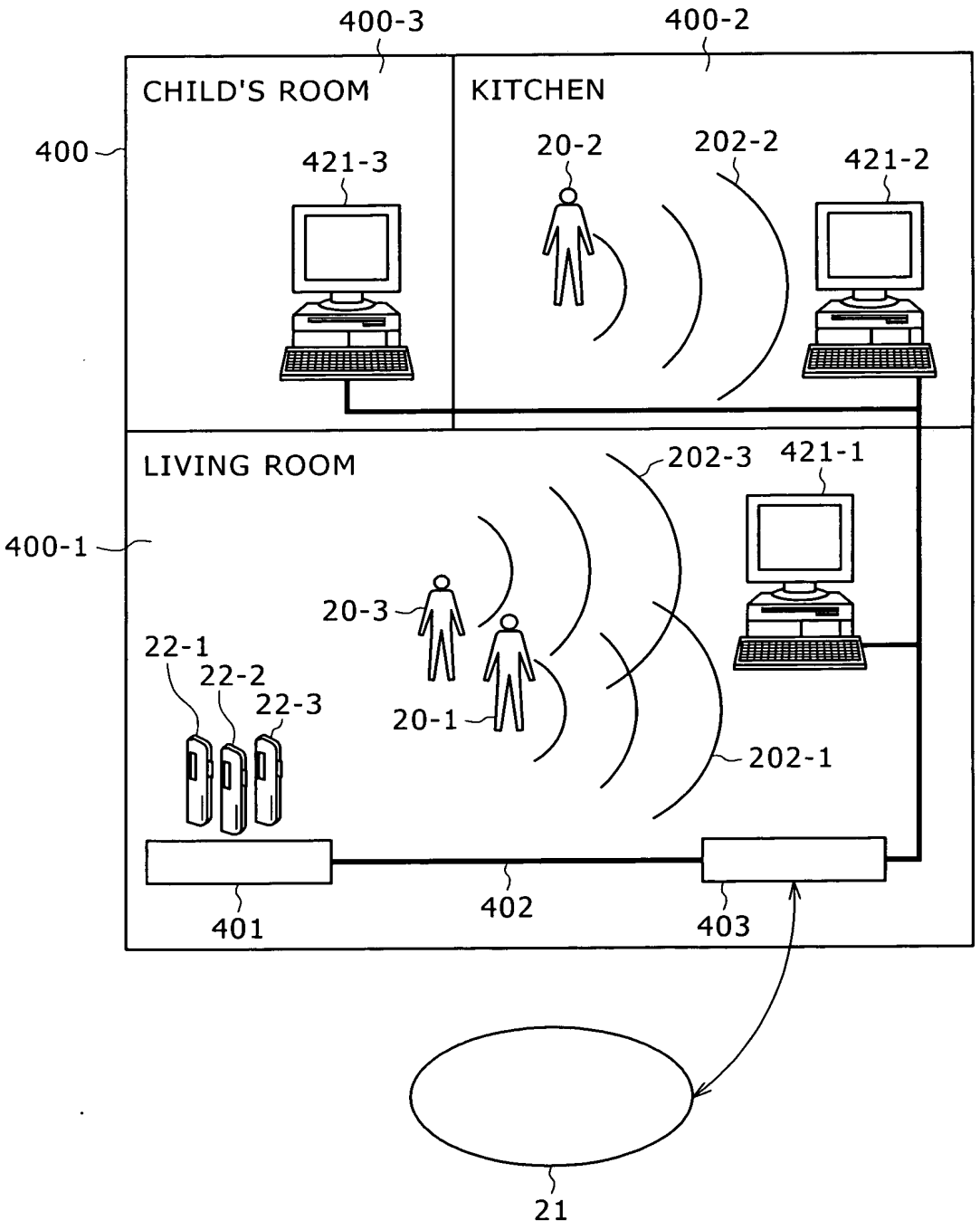

400-3
400-2
CHILD'S ROOM
KITCHEN
400
421-3
20-2
202-2
421-2
LIVING ROOM
202-3
421-1
400-1
20-3
22-1
22-2
22-3
20-1
202-1
401
402
403
21

FIG. 29

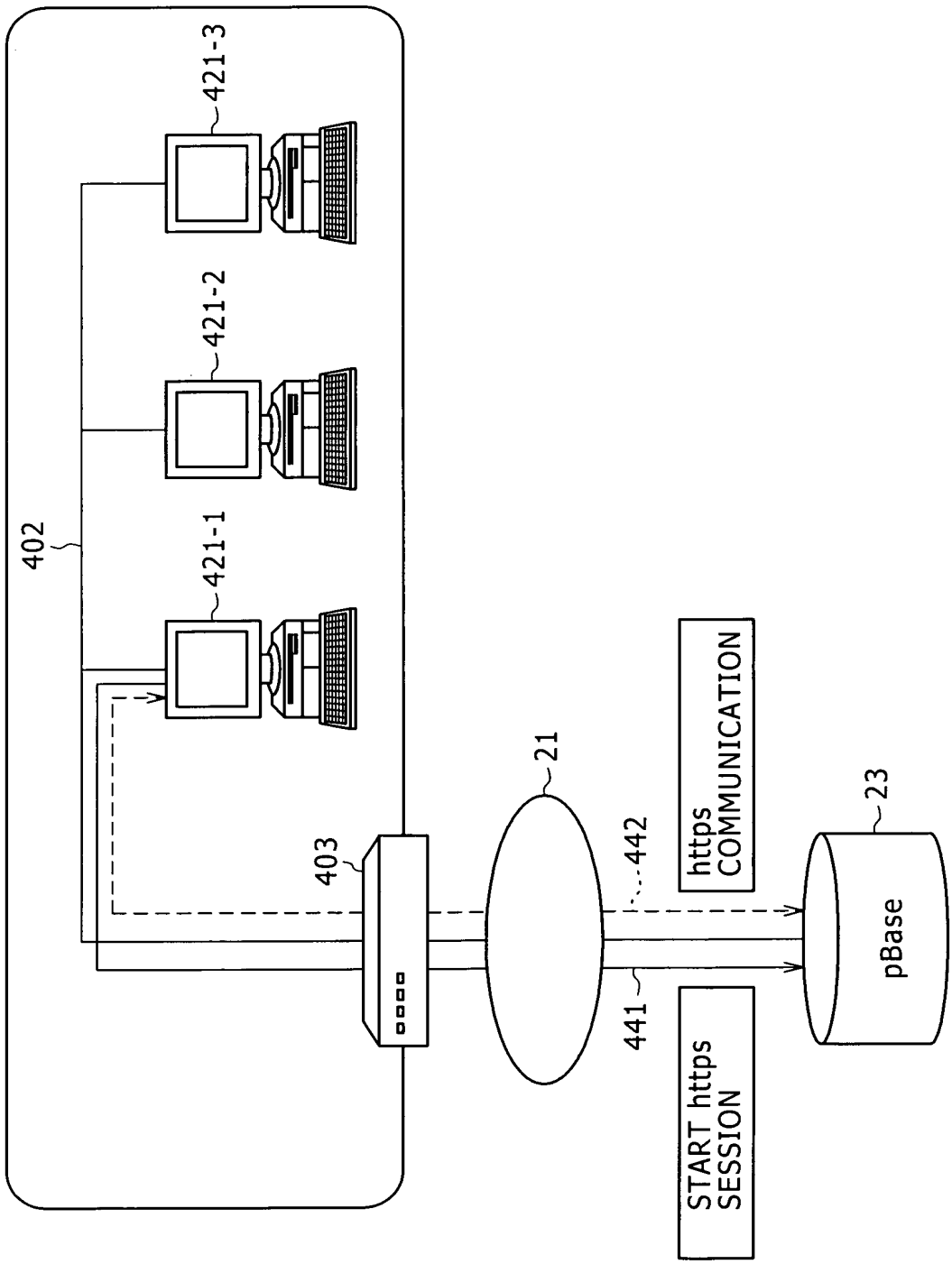

421-3
421-2
421-1
402
403
21
442
441
https COMMUNICATION
START https SESSION
23
pBase

FIG. 30

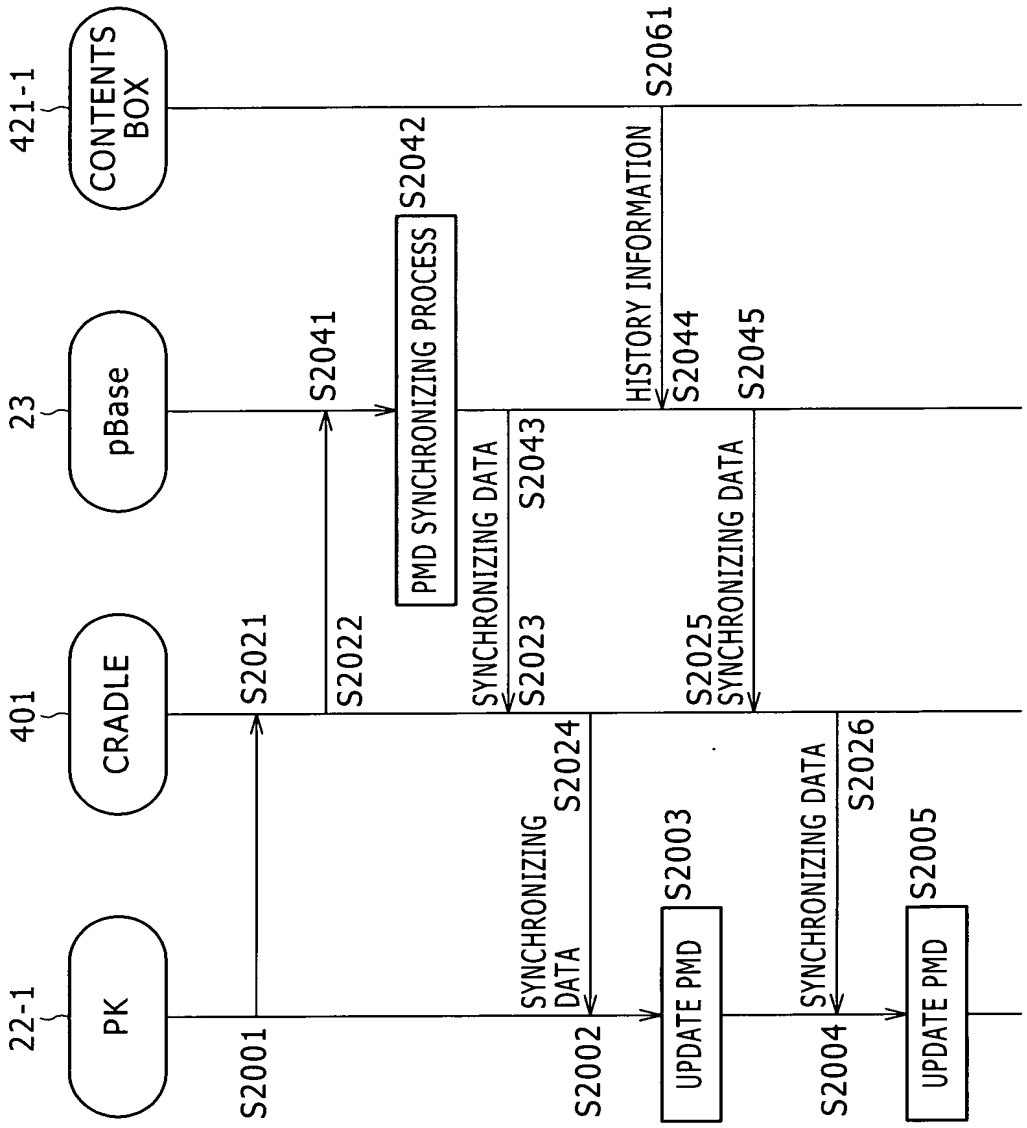

22-1
PK
401
CRADLE
23
pBase
421-1
CONTENTS BOX
S2001
S2021
S2041
S2042
PMD SYNCHRONIZING PROCESS
S2061
HISTORY INFORMATION
S2022
S2044
S2045
SYNCHRONIZING DATA
S2043
SYNCHRONIZING DATA
S2023
S2025
SYNCHRONIZING DATA
SYNCHRONIZING DATA
S2024
S2026
S2002
S2003
S2004
S2005
UPDATE PMD
UPDATE PMD

FIG. 31

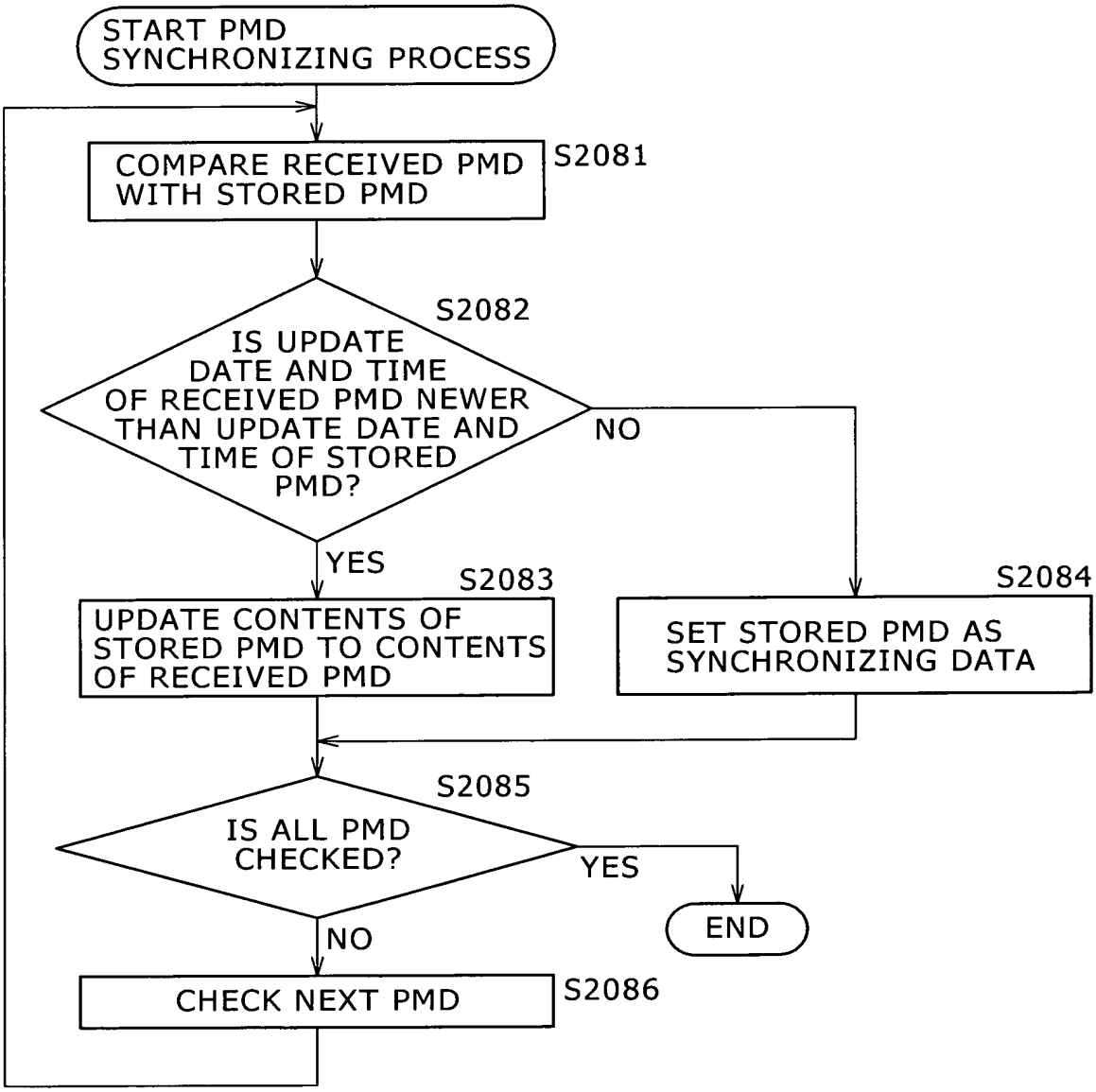

START PMD SYNCHRONIZING PROCESS
COMPARE RECEIVED PMD WITH STORED PMD
S2081
S2082
IS UPDATE DATE AND TIME OF RECEIVED PMD NEWER THAN UPDATE DATE AND TIME OF STORED PMD?
NO
YES
S2083
UPDATE CONTENTS OF STORED PMD TO CONTENTS OF RECEIVED PMD
S2084
SET STORED PMD AS SYNCHRONIZING DATA
S2085
IS ALL PMD CHECKED?
YES
END
NO
CHECK NEXT PMD
S2086

FIG. 32

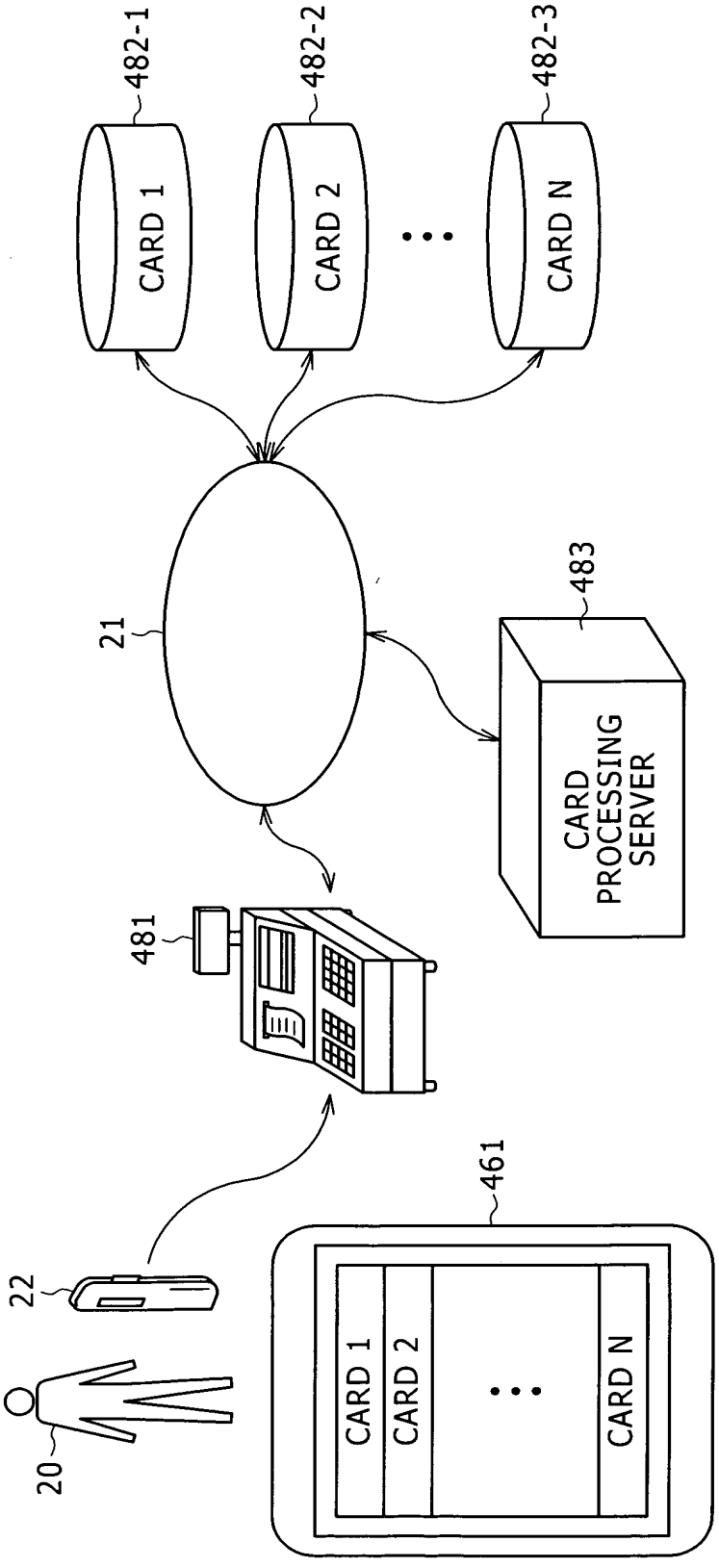

482-1
482-2
482-3
CARD 1
CARD 2
CARD N
21
483
CARD PROCESSING SERVER
481
461
22
20
CARD 1
CARD 2
CARD N

FIG. 33

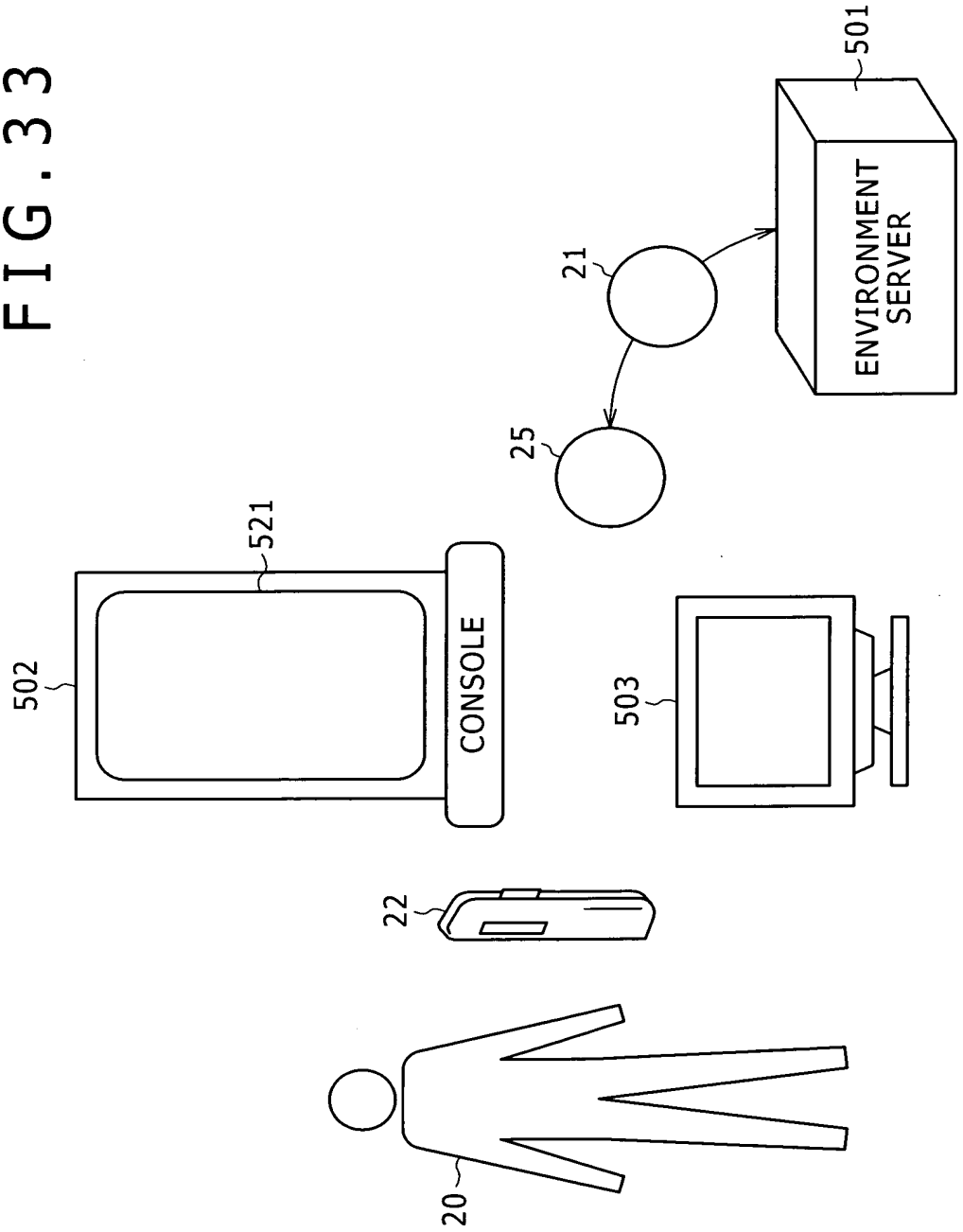


FIG. 34

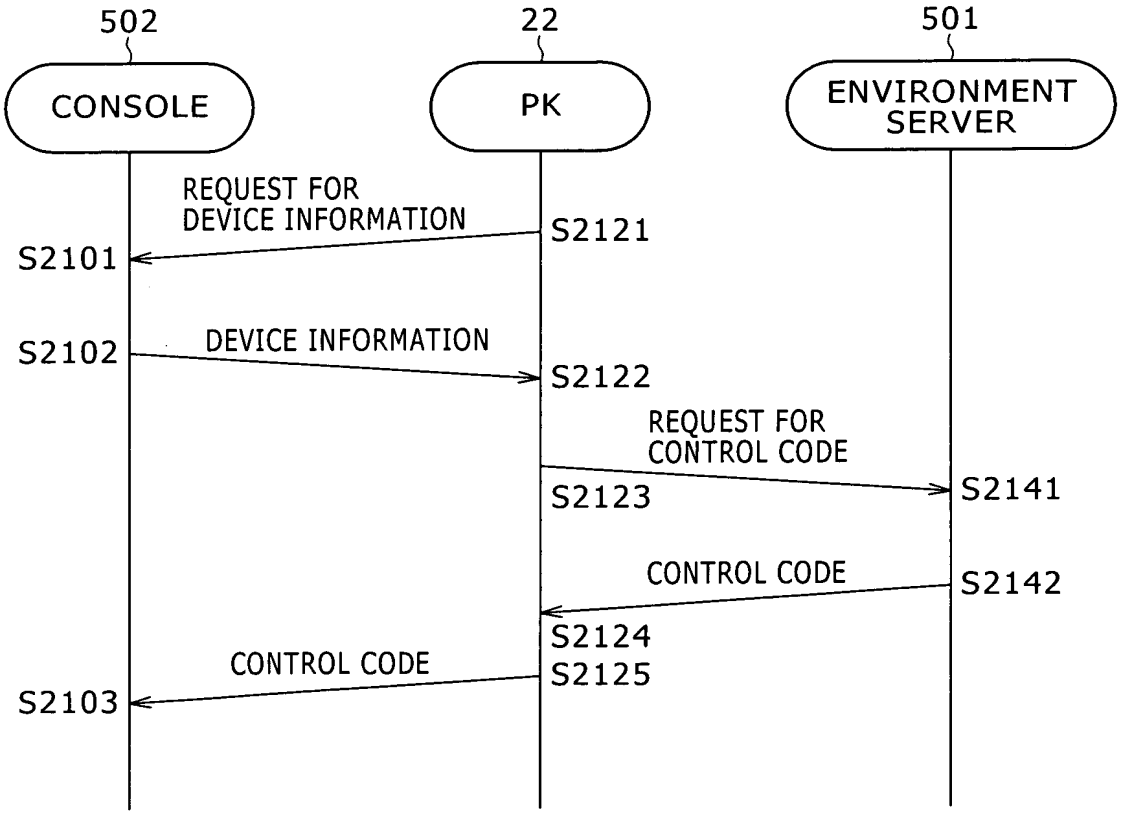

502
22
501
CONSOLE
PK
ENVIRONMENT SERVER
REQUEST FOR DEVICE INFORMATION
S2121
S2101
S2102
DEVICE INFORMATION
S2122
REQUEST FOR CONTROL CODE
S2123
S2141
CONTROL CODE
S2142
S2124
CONTROL CODE
S2125
S2103

FIG. 35

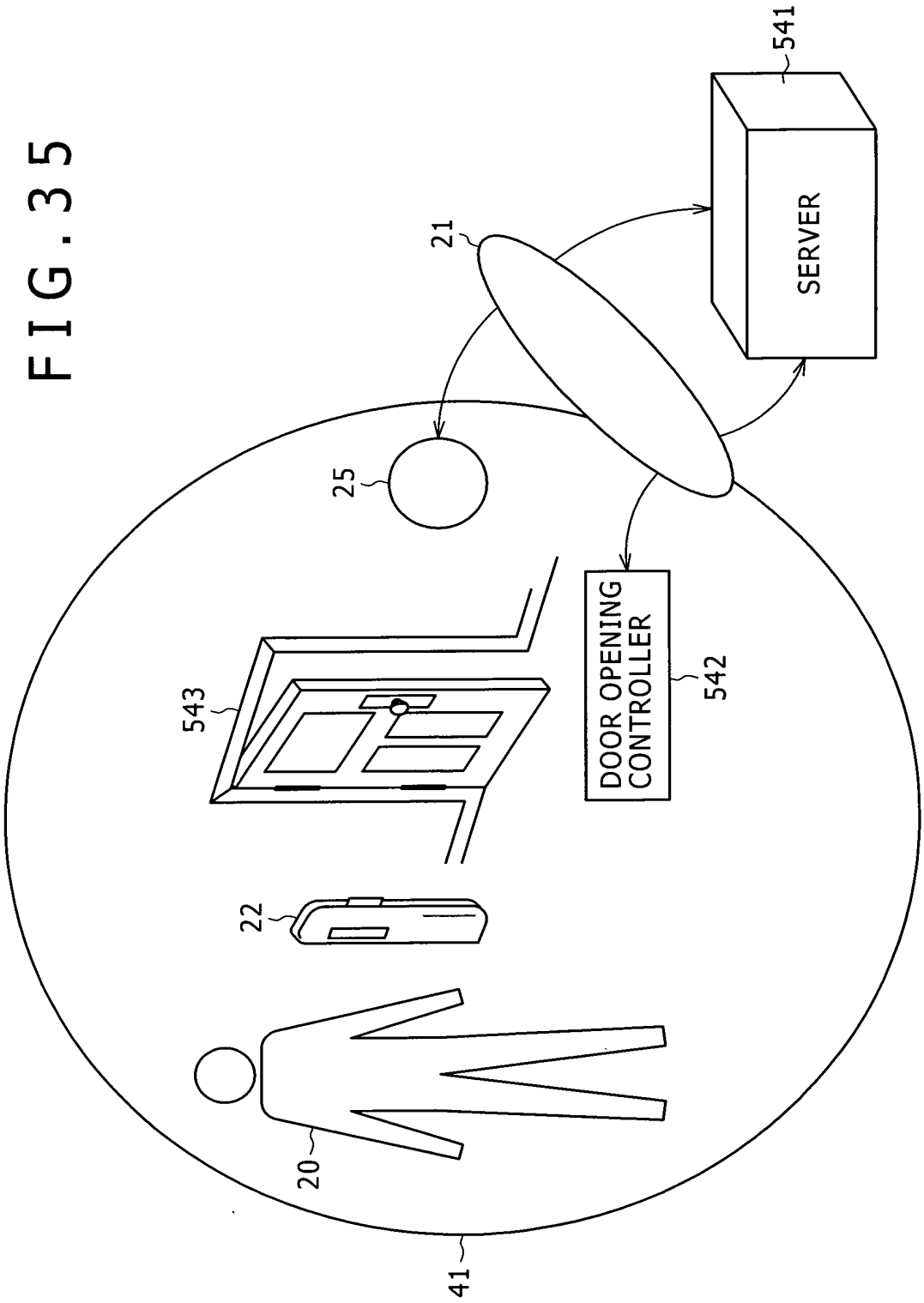


FIG. 36

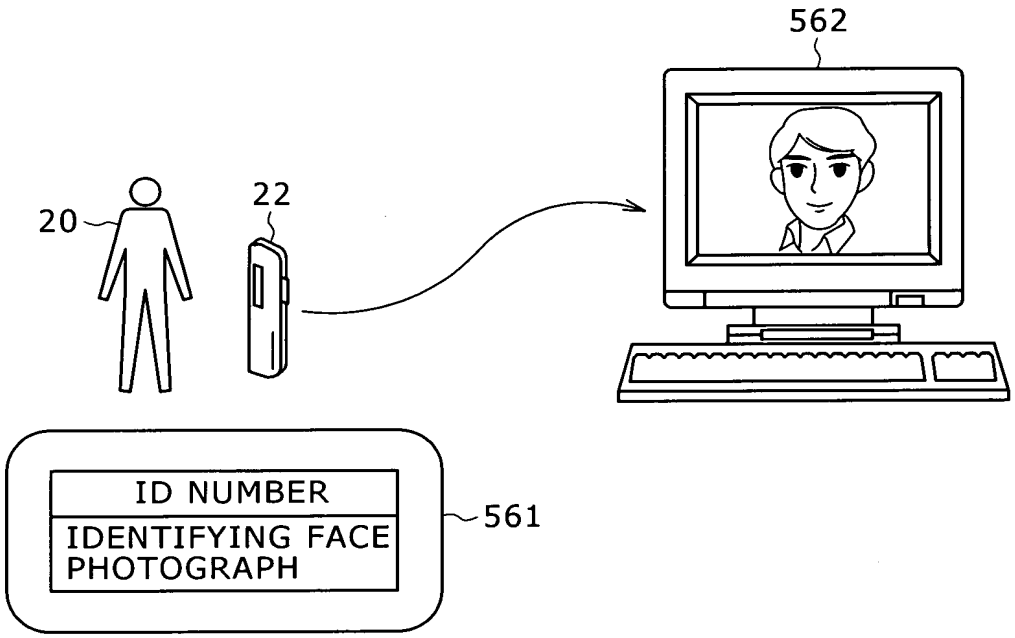


FIG. 37

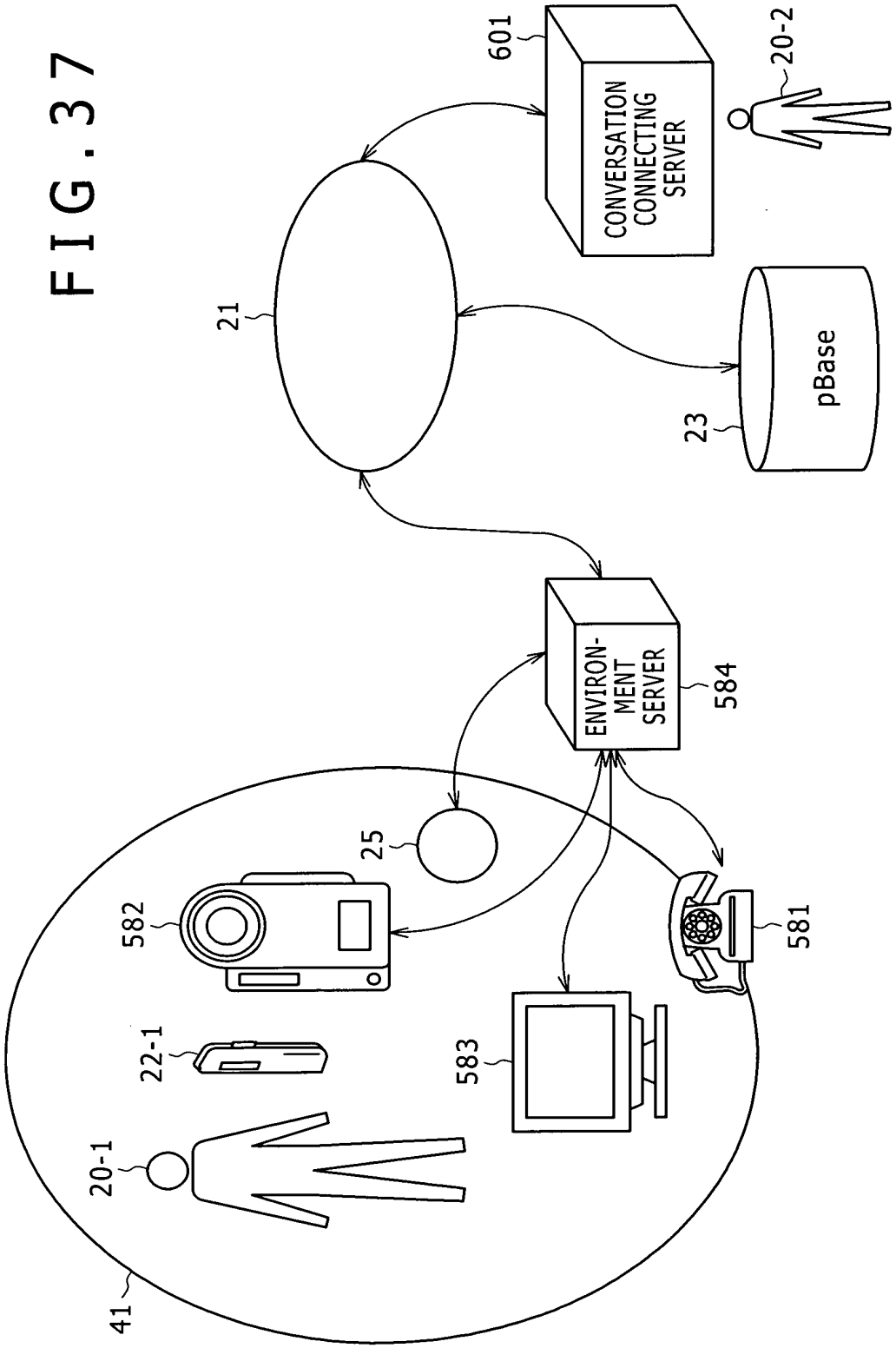

601
CONVERSATION CONNECTING SERVER
20-2
21
23
pBase
ENVIRON-MENT SERVER
584
25
582
581
22-1
583
20-1
41

FIG. 38

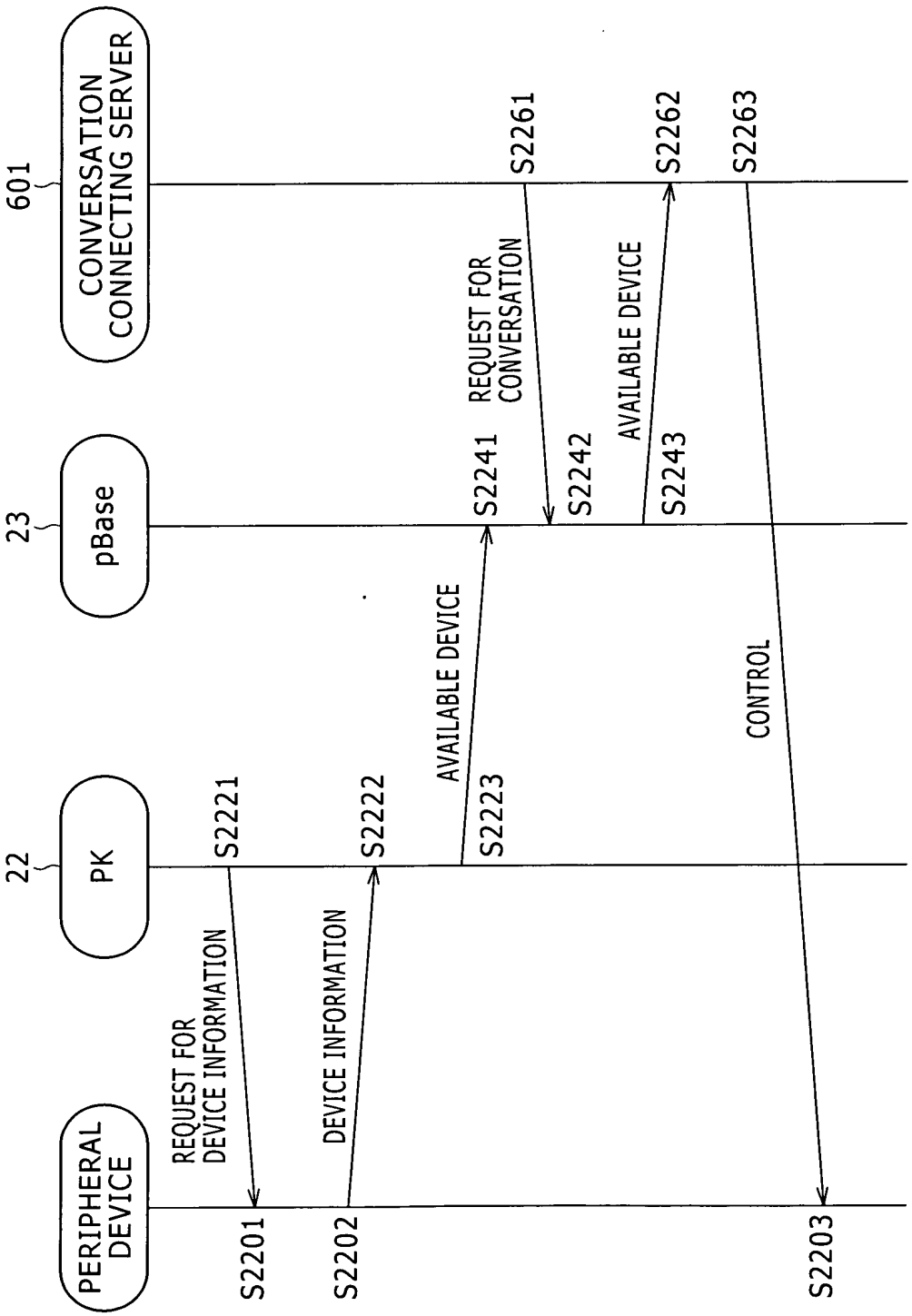

601
CONVERSATION CONNECTING SERVER
23
pBase
22
PK
PERIPHERAL DEVICE
S2261
S2262
S2263
S2241
S2242
S2243
S2221
S2222
S2223
S2201
S2202
S2203
REQUEST FOR CONVERSATION
AVAILABLE DEVICE
AVAILABLE DEVICE
CONTROL
REQUEST FOR DEVICE INFORMATION
DEVICE INFORMATION

FIG. 39

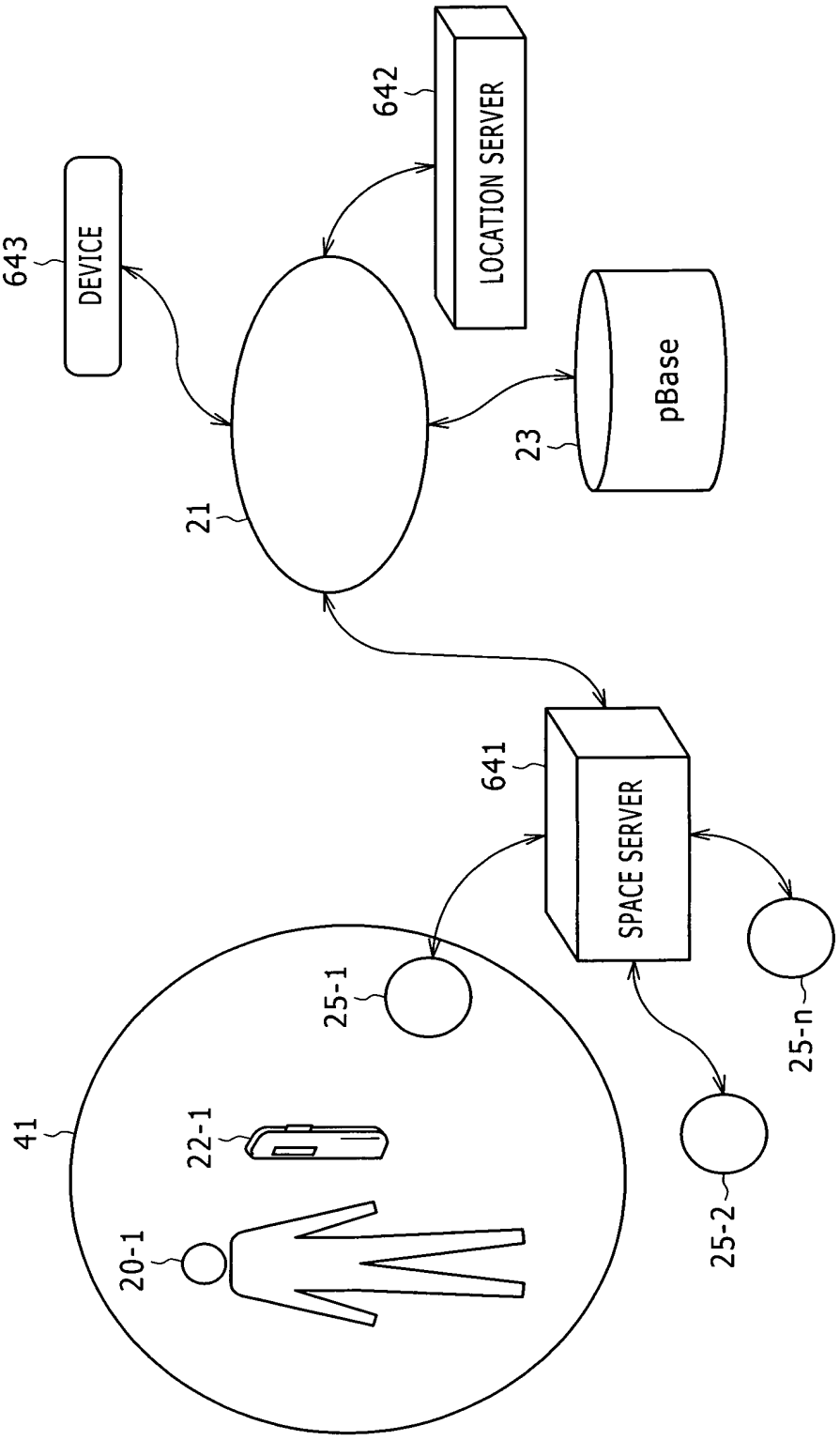

642
LOCATION SERVER
643
DEVICE
21
23
pBase
641
SPACE SERVER
41
22-1
20-1
25-1
25-2
25-n

FIG. 40

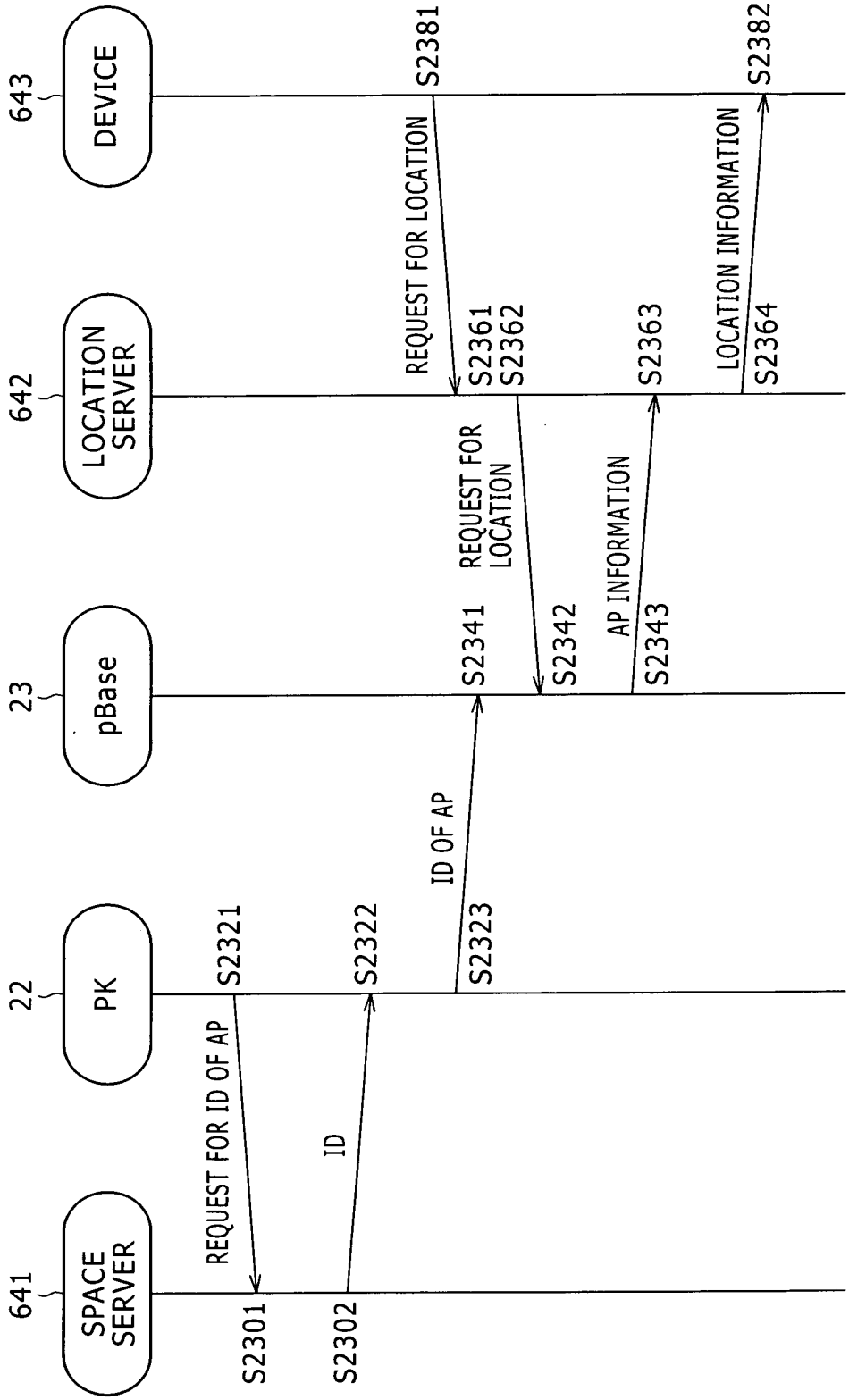

641
SPACE SERVER
22
PK
23
pBase
642
LOCATION SERVER
643
DEVICE
REQUEST FOR ID OF AP
S2301
ID
S2302
S2321
S2322
ID OF AP
S2323
S2341
REQUEST FOR LOCATION
S2342
AP INFORMATION
S2343
REQUEST FOR LOCATION
S2361
S2362
S2363
LOCATION INFORMATION
S2364
S2381
S2382

FIG. 41

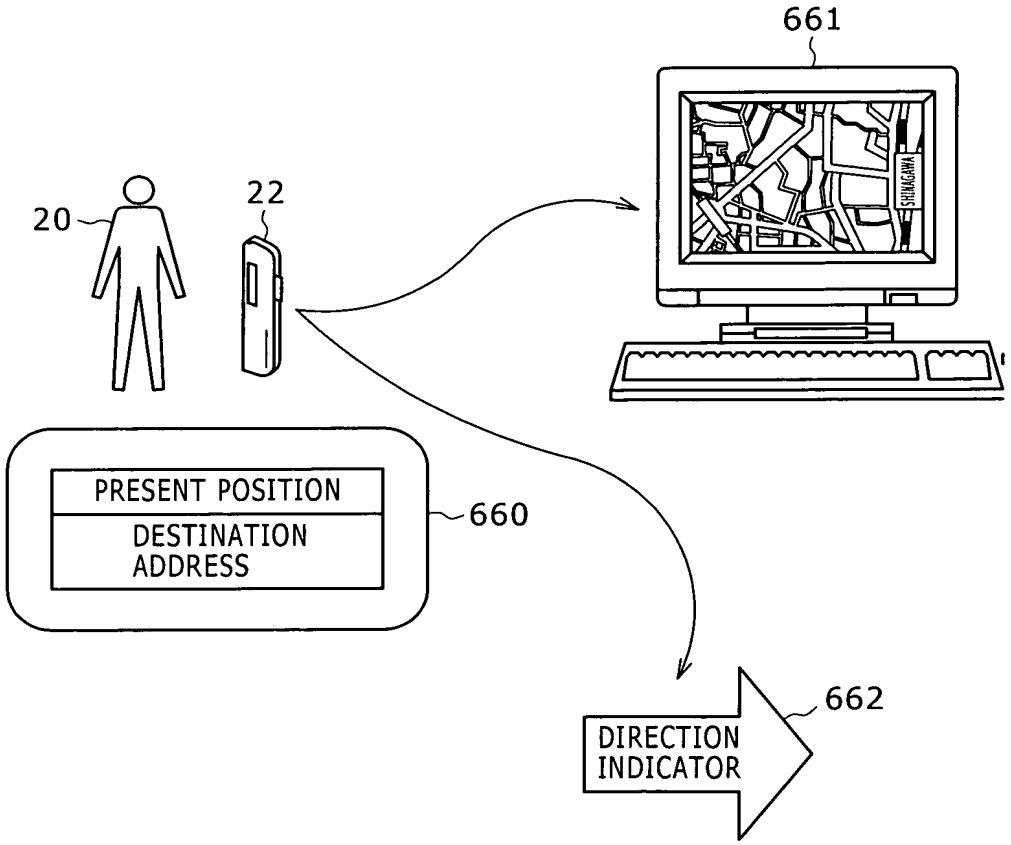

661
20
22
SHINAGAWA
PRESENT POSITION
DESTINATION ADDRESS
660
662
DIRECTION INDICATOR

FIG. 42

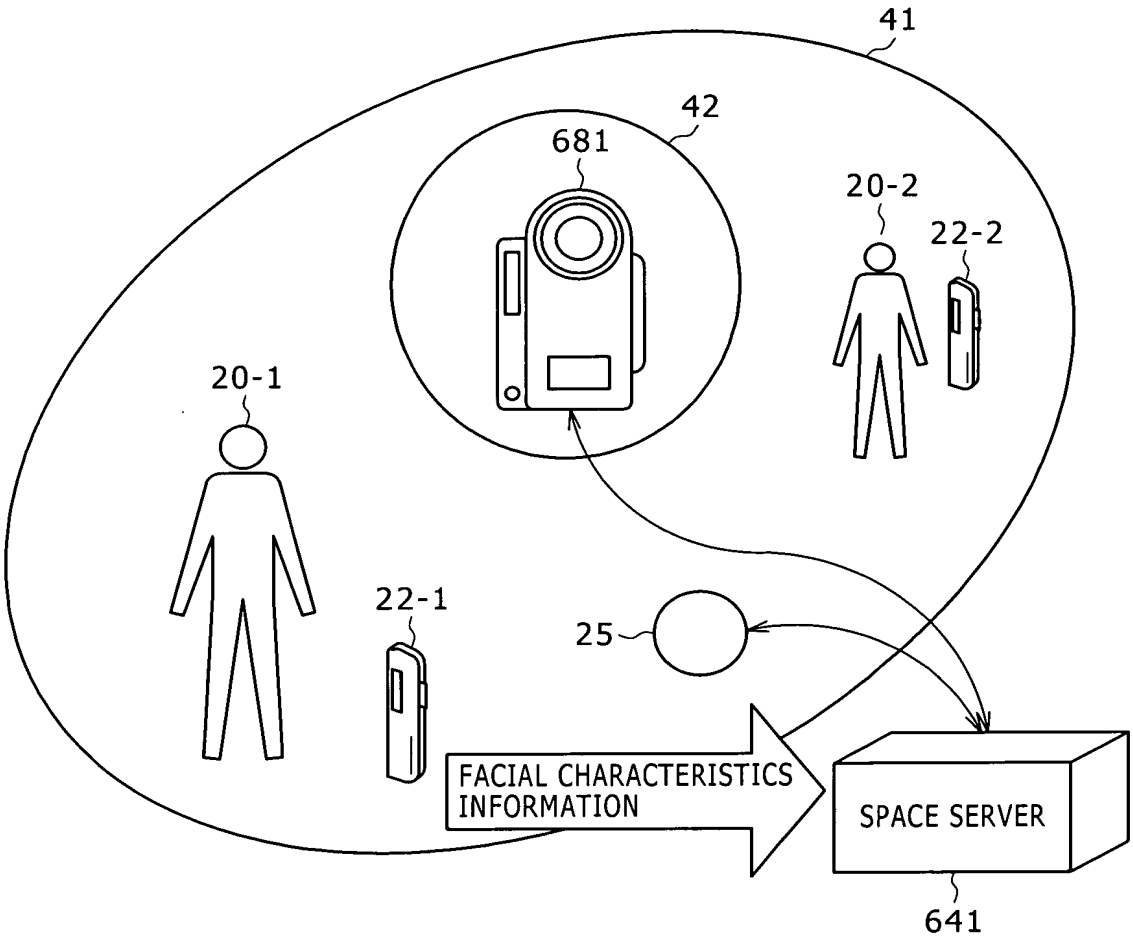

41
42
681
20-2
22-2
20-1
22-1
25
FACIAL CHARACTERISTICS INFORMATION
SPACE SERVER
641

FIG. 43

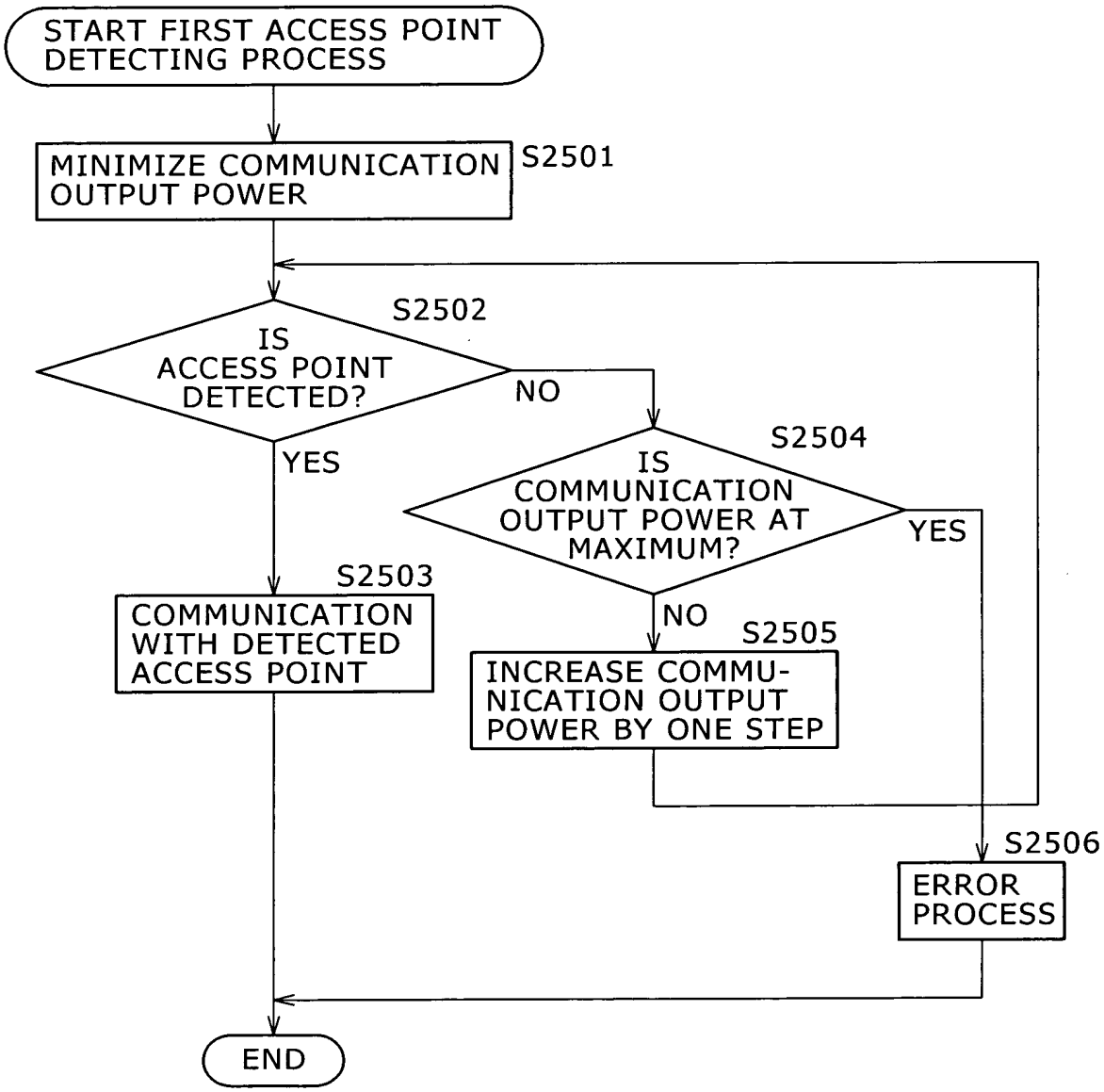

START FIRST ACCESS POINT DETECTING PROCESS
MINIMIZE COMMUNICATION OUTPUT POWER
S2501
S2502
IS ACCESS POINT DETECTED?
NO
YES
S2504
IS COMMUNICATION OUTPUT POWER AT MAXIMUM?
YES
NO
S2503
COMMUNICATION WITH DETECTED ACCESS POINT
S2505
INCREASE COMMUNICATION OUTPUT POWER BY ONE STEP
S2506
ERROR PROCESS
END

FIG. 44

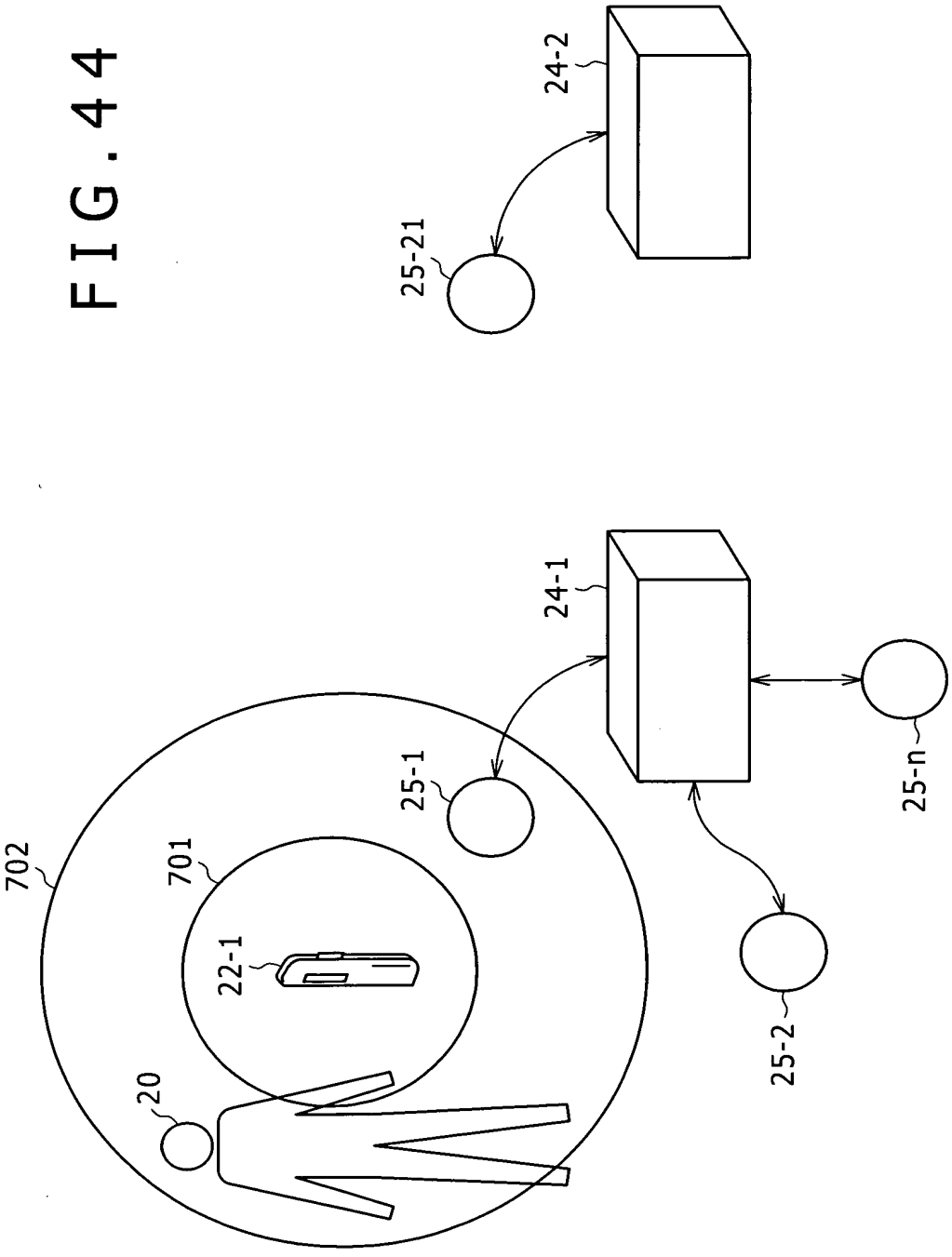


FIG. 45

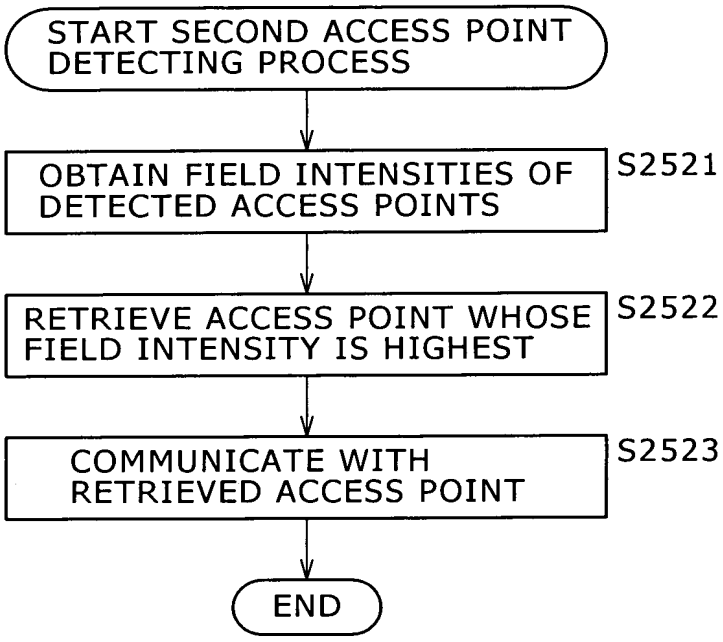

START SECOND ACCESS POINT DETECTING PROCESS
OBTAIN FIELD INTENSITIES OF DETECTED ACCESS POINTS
S2521
RETRIEVE ACCESS POINT WHOSE FIELD INTENSITY IS HIGHEST
S2522
COMMUNICATE WITH RETRIEVED ACCESS POINT
S2523
END

FIG. 46

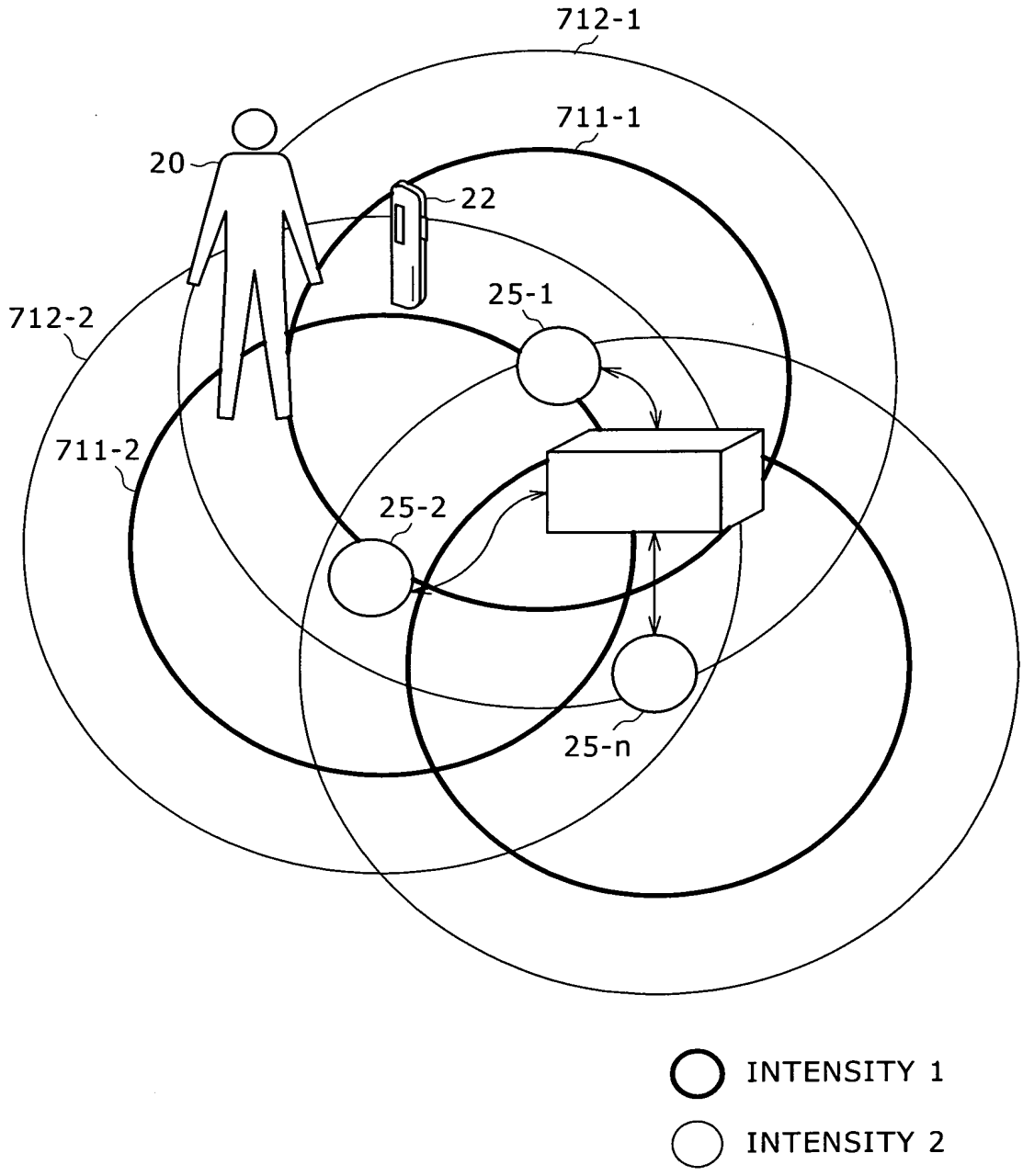


FIG. 47

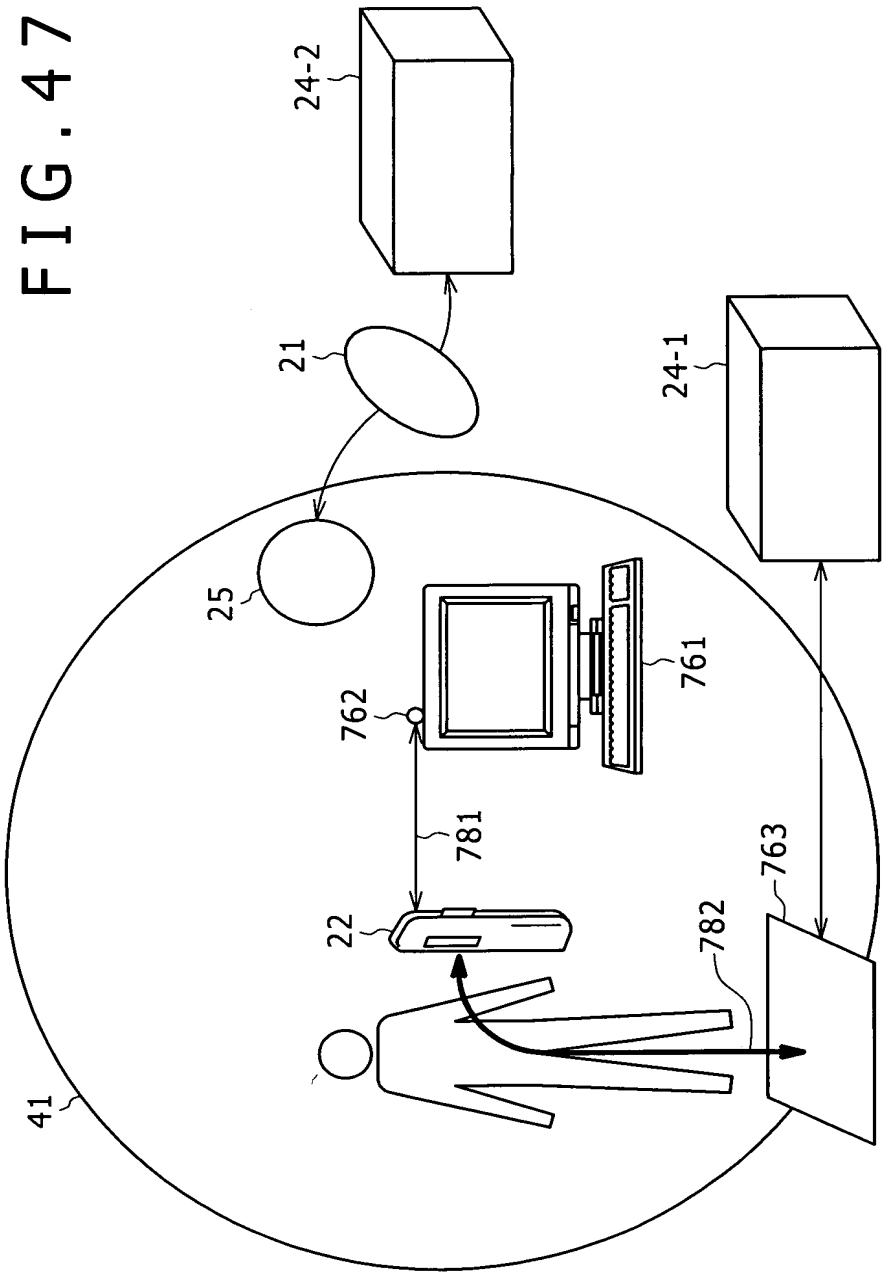


FIG. 48

801

PROPERTY	CONTENTS
PROGRAM	PROGRAM CODE ENTITY
NAME	FOO
PUSH	"URGENT MESSAGE RECEIVED..."

FIG. 49

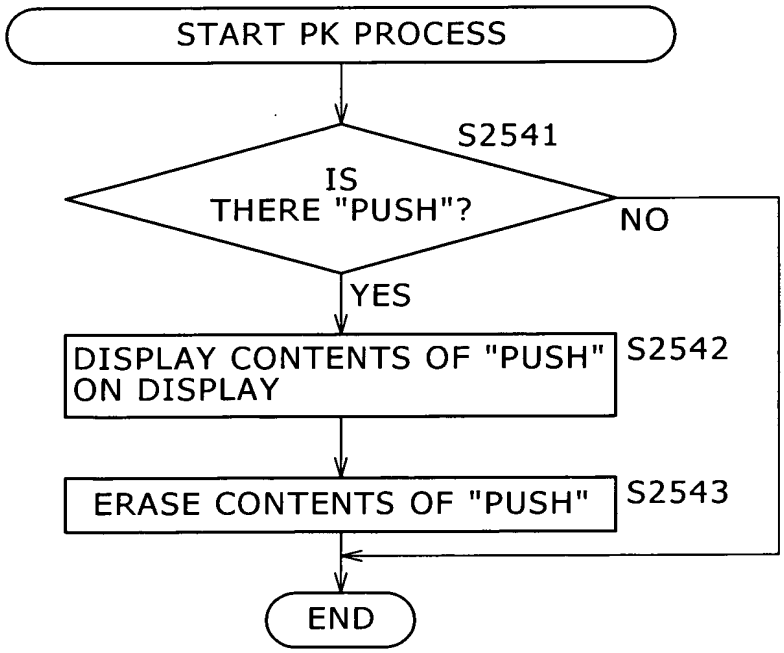


FIG. 50

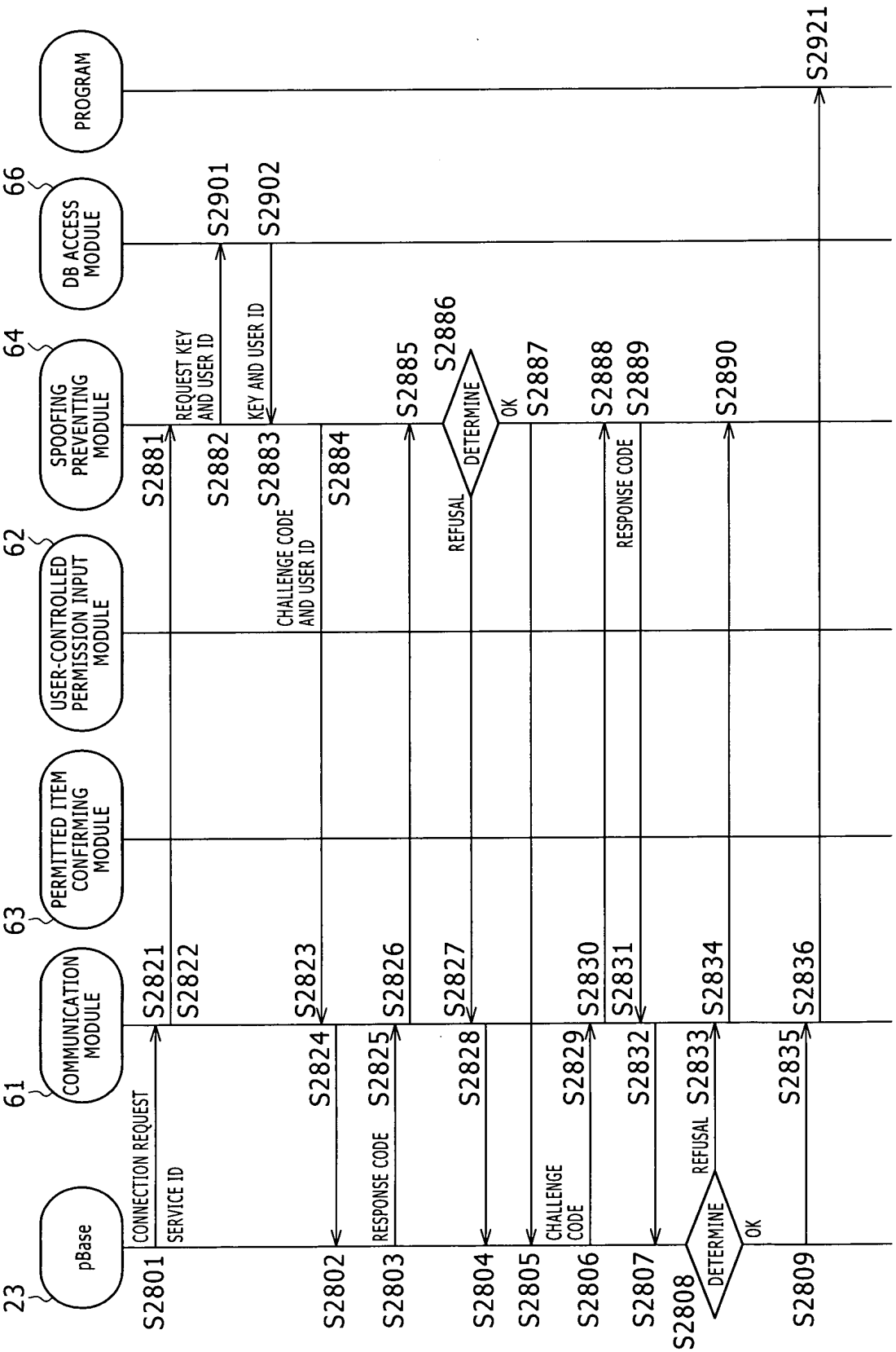

23
pBase
61
COMMUNICATION MODULE
63
PERMITTED ITEM CONFIRMING MODULE
62
USER-CONTROLLED PERMISSION INPUT MODULE
64
SPOOFING PREVENTING MODULE
66
DB ACCESS MODULE
PROGRAM
S2801
CONNECTION REQUEST
SERVICE ID
S2802
S2803
RESPONSE CODE
S2804
S2805
CHALLENGE CODE
S2806
S2807
S2808
DETERMINE
REFUSAL
OK
S2809
S2821
S2822
S2823
CHALLENGE CODE AND USER ID
S2824
S2825
RESPONSE CODE
S2826
S2827
REFUSAL
S2828
S2829
S2830
S2831
RESPONSE CODE
S2832
S2833
S2834
S2835
S2836
S2881
REQUEST KEY AND USER ID
S2882
S2883
KEY AND USER ID
S2884
S2885
S2886
DETERMINE
OK
S2887
S2888
S2889
S2890
S2901
S2902
S2921

FIG. 51

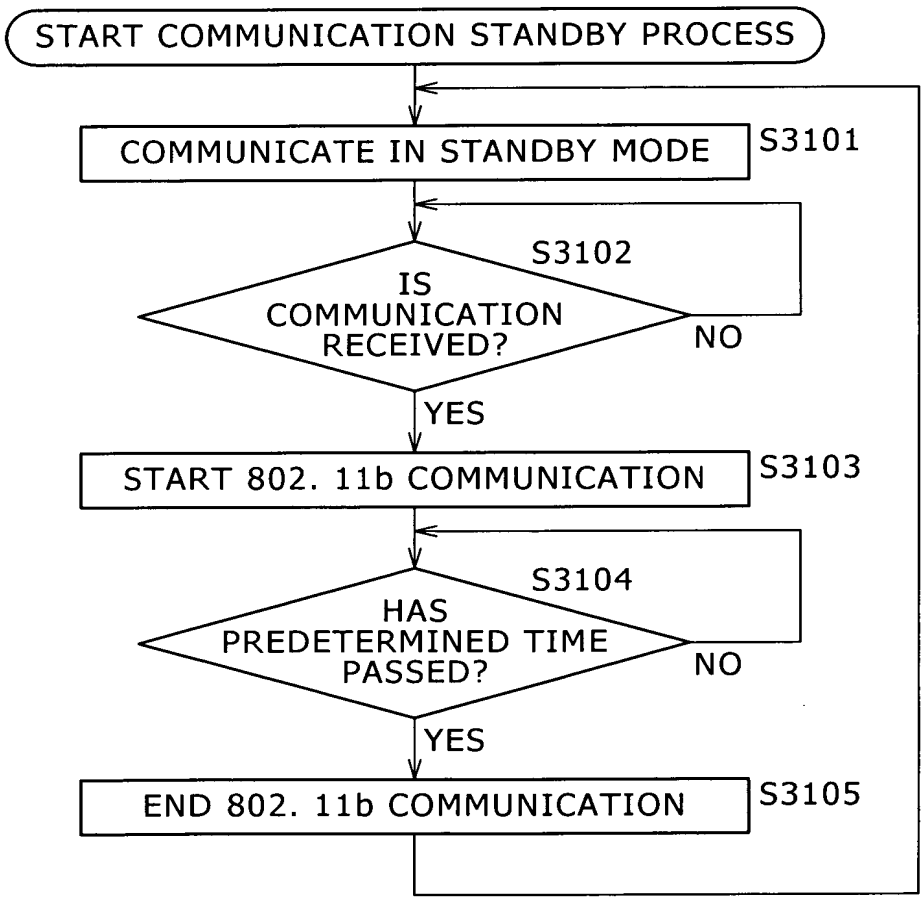

START COMMUNICATION STANDBY PROCESS
COMMUNICATE IN STANDBY MODE
S3101
S3102
IS COMMUNICATION RECEIVED?
NO
YES
START 802. 11b COMMUNICATION
S3103
S3104
HAS PREDETERMINED TIME PASSED?
NO
YES
END 802. 11b COMMUNICATION
S3105

FIG. 52

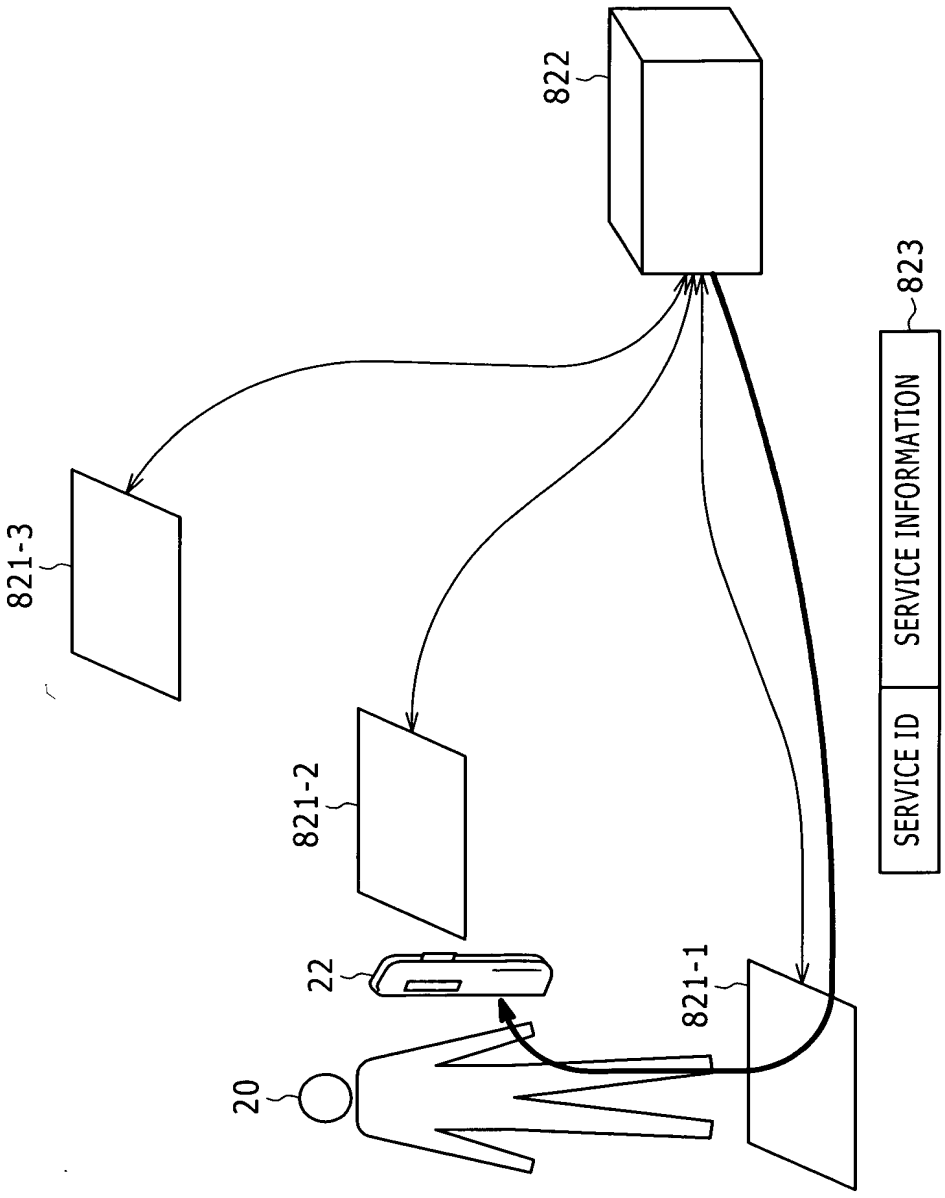
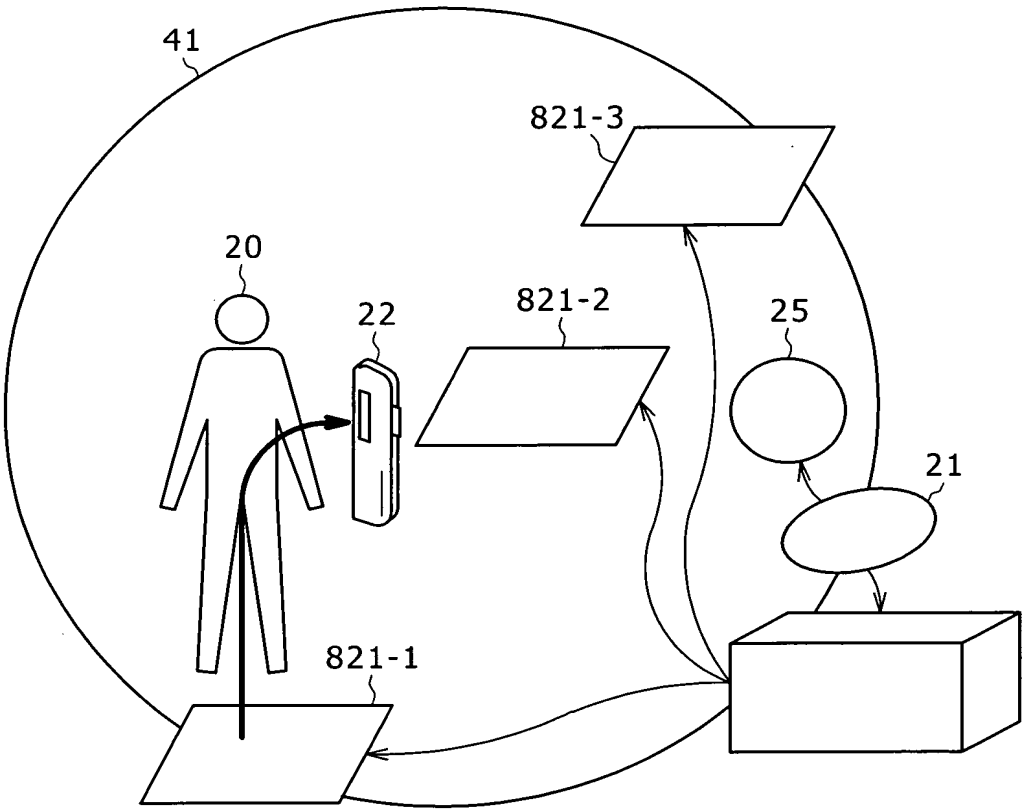


FIG. 53



SERVICE ID	SERVICE INFORMATION	823

FIG. 54A

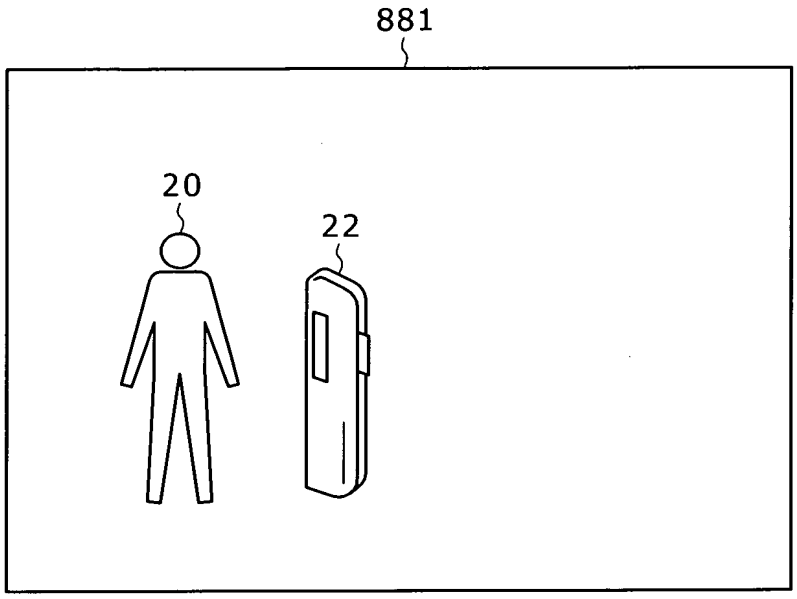


FIG. 54B

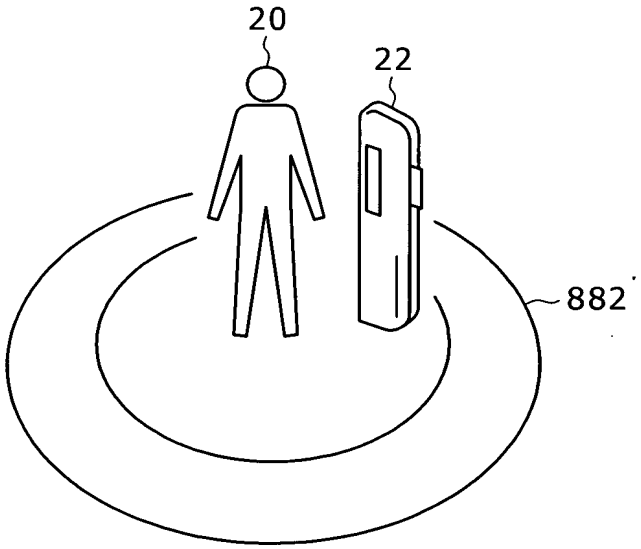


FIG. 55

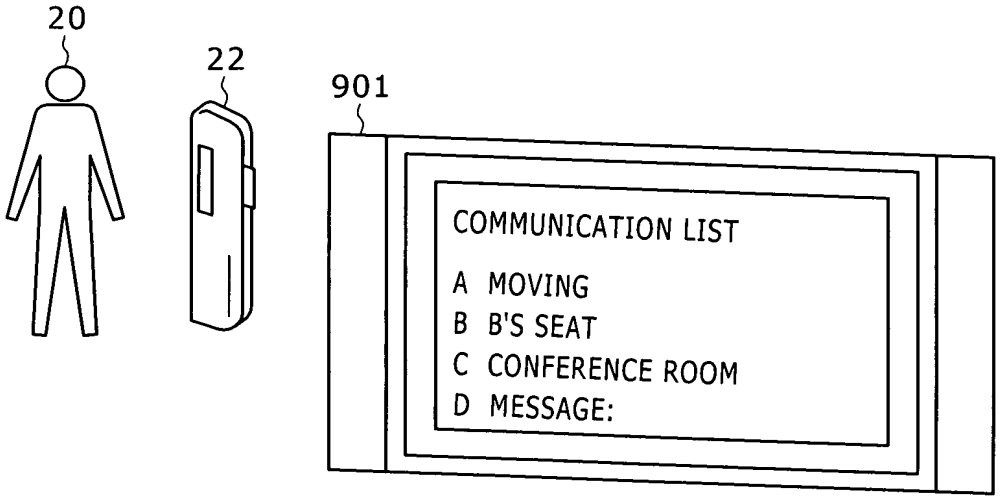

20
22
901
COMMUNICATION LIST
A MOVING
B B'S SEAT
C CONFERENCE ROOM
D MESSAGE:

FIG.56

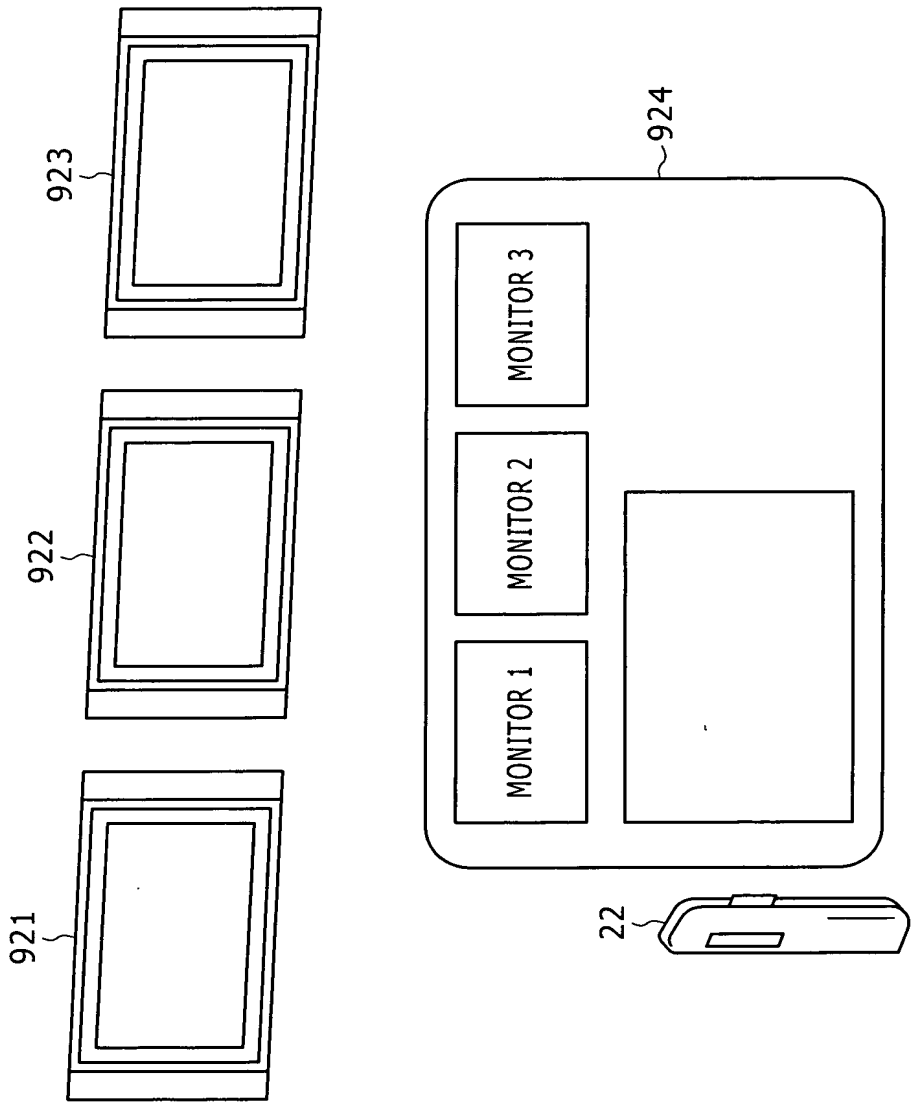


FIG. 57

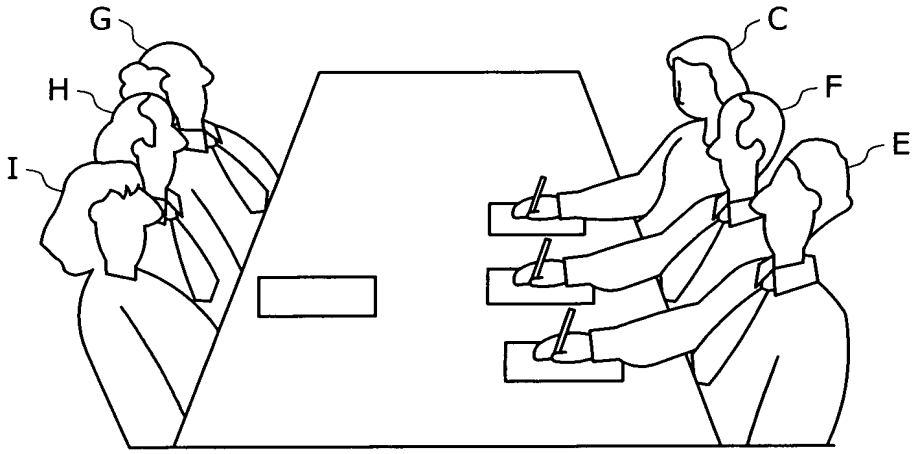


FIG.58

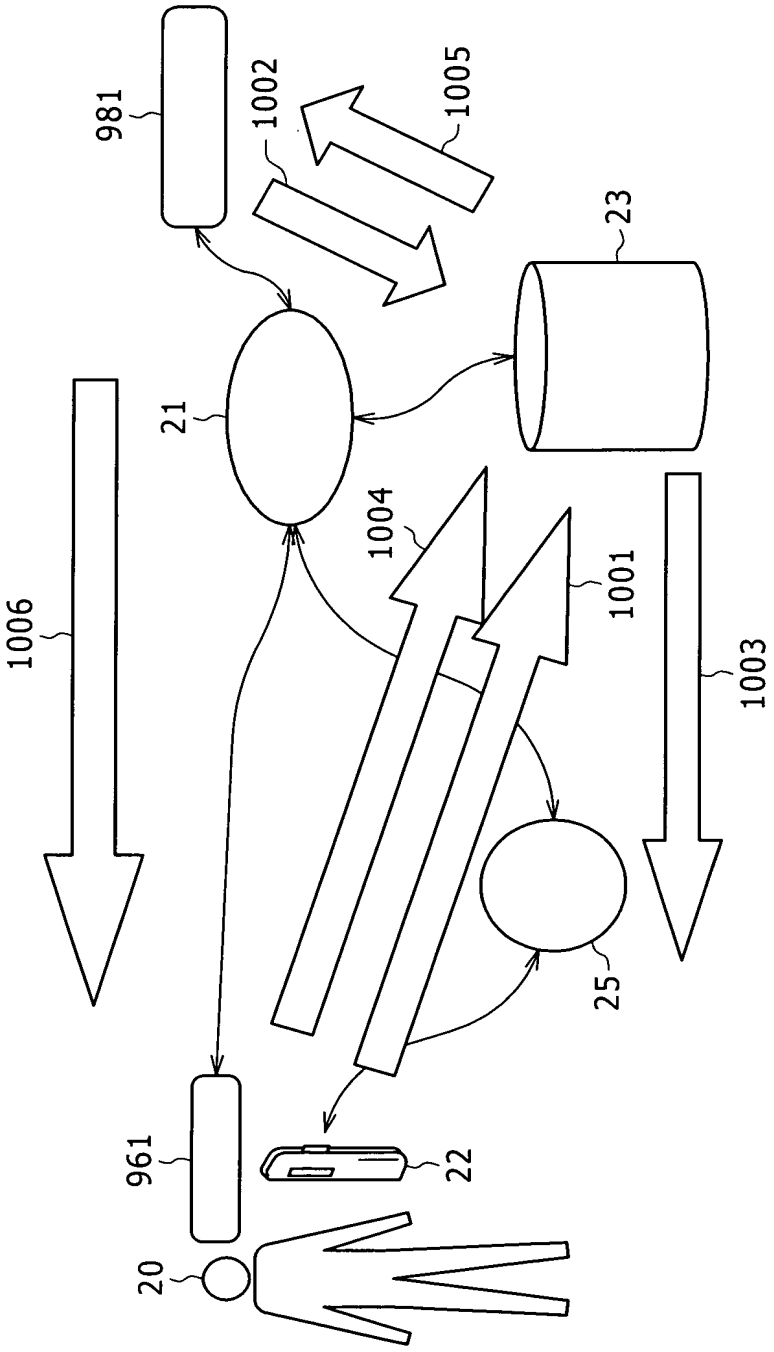


FIG.59

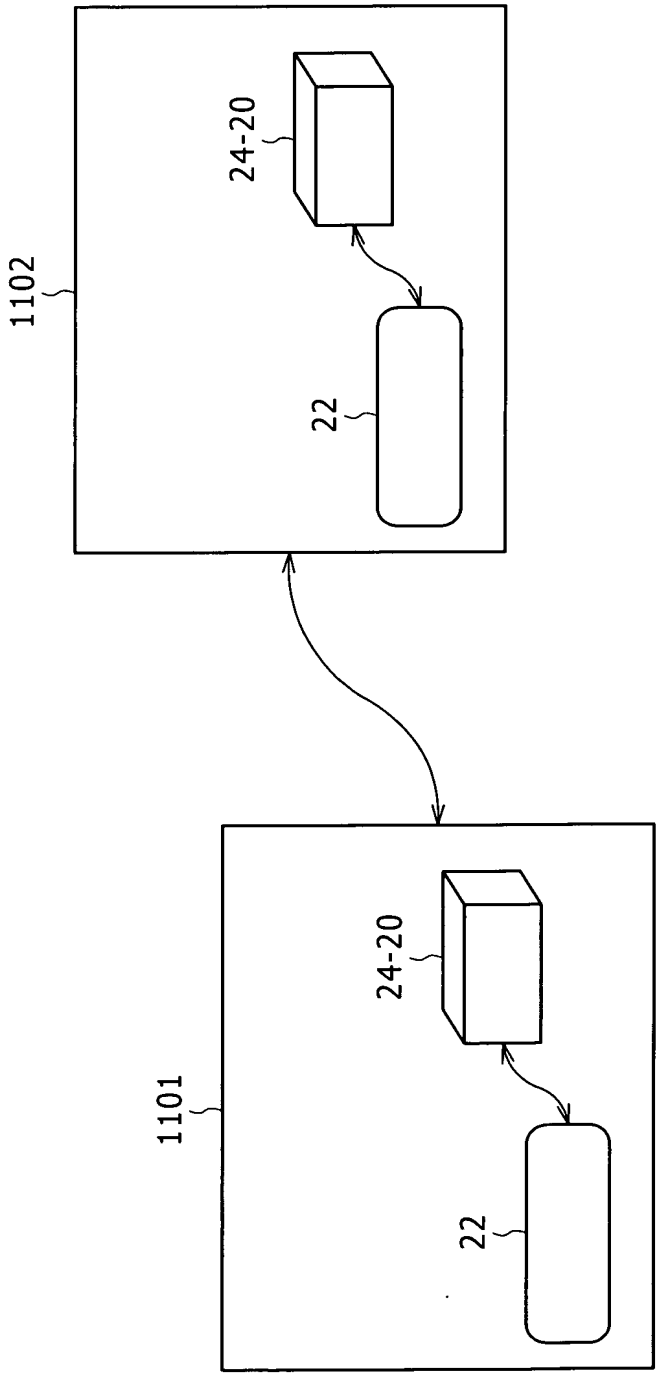
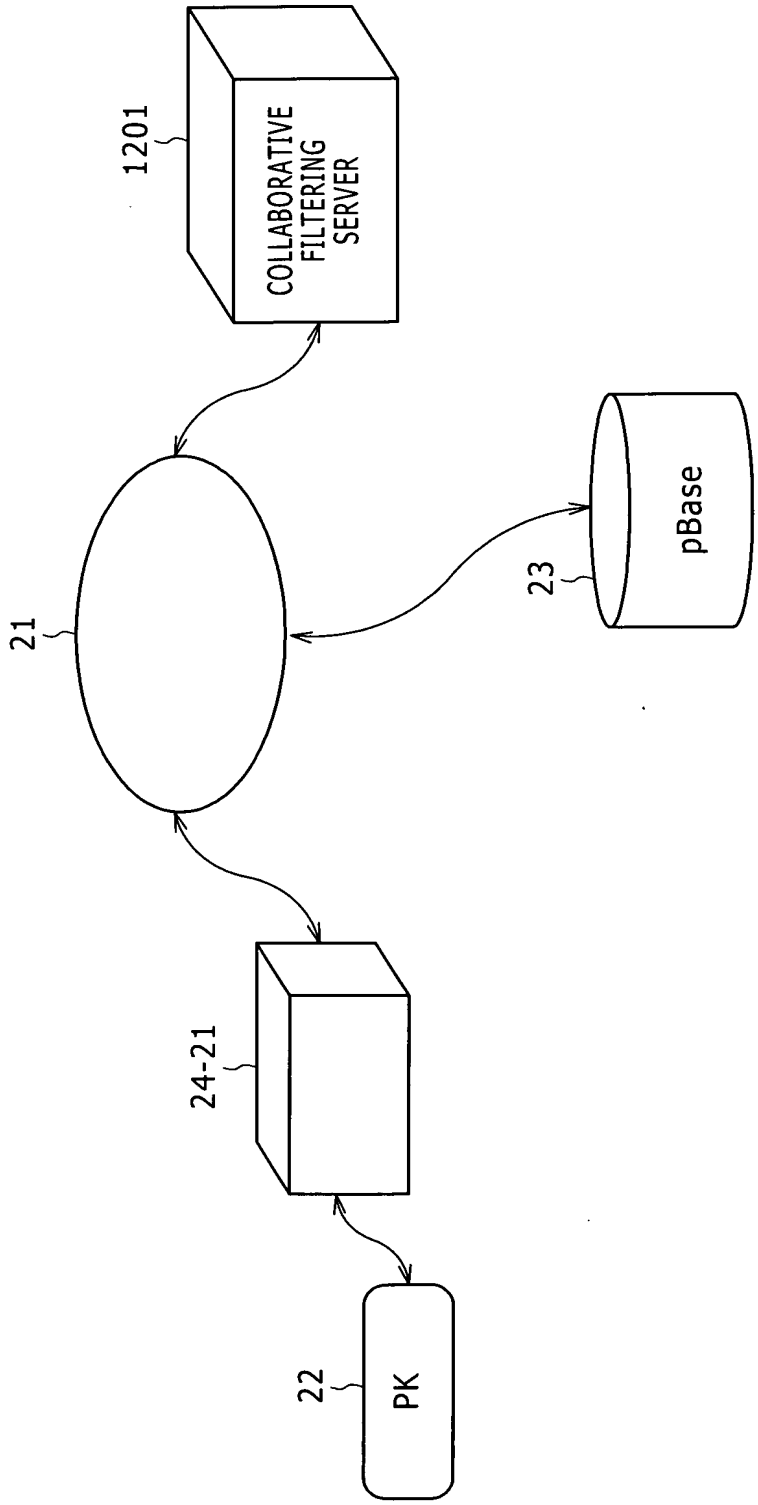



FIG.60